ST-SA5ES

SERVICE MANUAL

AEP Model

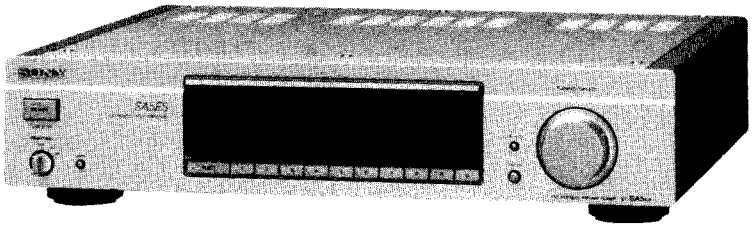

Photo : GOLD

SPECIFICATIONS

FM tuner section

Frequency range	87.5 - 108.0 MHz
Antenna terminals	75 ohms, unbalanced
Intermediate frequency	10.7 MHz
Sensitivity	at 26 dB quieting (mono) 10.3 dBf, 0.9 µV/75Ω at 46 dB quieting (stereo) 38.5 dBf, 23 µV/75Ω
Usable sensitivity (IHF)	10.3 dBf, 0.9 µV/75Ω
S/N	at 40 kHz deviation 95 dB (mono), 86 dB (stereo)
Harmonic distortion	WIDE 0.008% (mono), 0.02 % (stereo) NARROW 0.04% (mono), 0.07 % (stereo)
Frequency response	15 Hz - 15 kHz (±0.2 dB)
Separation	65 dB at 1 kHz
Selectivity	at 400 kHz WIDE 80 dB NARROW 90 dB at 300 kHz WIDE 45 dB NARROW 70 dB
Output	at 40 kHz deviation 600 mV

AM tuner section

Frequency range	MW: 531 - 1,602 kHz (9 kHz step) LW: 153 - 279 kHz (1 kHz step)
Intermediate frequency	450 kHz
Usable Sensitivity	(with AM loop aerial) MW: 200 µV/m LW: 700 µV/m

— Continued on next page —

MICROFILM

FM STEREO FM/AM TUNER

SONY®

Signal-to-noise ratio	MW: 54 dB (50 mV/m, 999 kHz) LW: 50 dB (50 mV/m, 216 kHz)
Harmonic distortion	0.3% (50 mV/m, 400 Hz)
Selectivity	50 dB

General

Power requirements	220-230 V, AC 50/60 Hz
Power consumption	15 W
Input impedance	75 ohms
Input connector	IEC-male
Dimensions	430 x 98 x 340 mm
Weight	6.3 kg
Supplied accessories	Audio cord (1) AM loop aerial (1) FM wire aerial (1)

Design and specifications are subject to change without notice.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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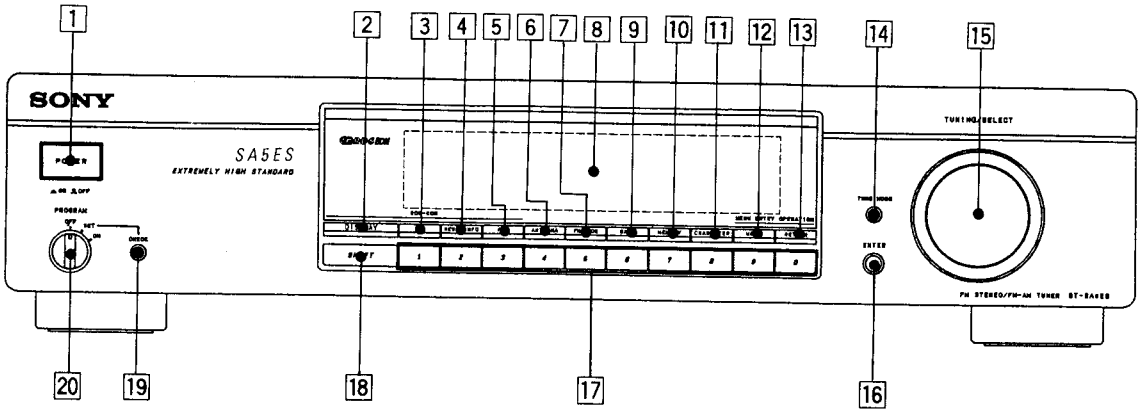
SECTION 1
GENERAL

Front Panel

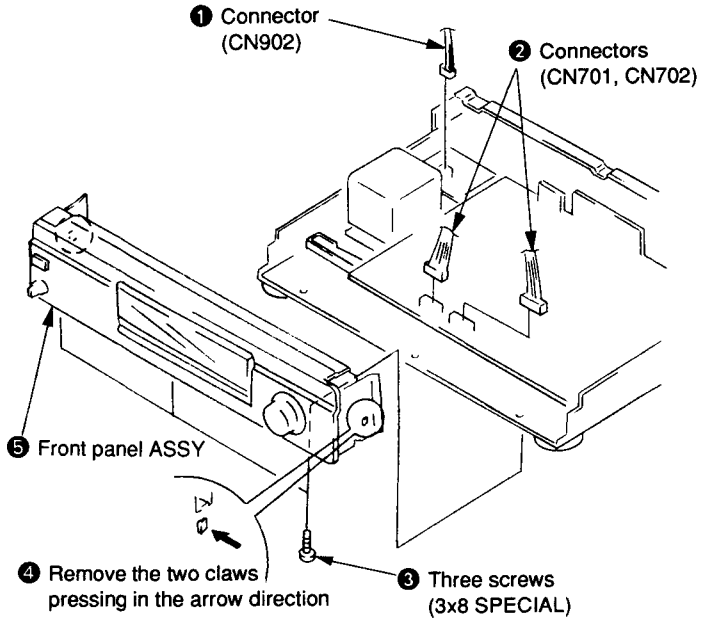


1 POWER switch
2 DISPLAY button
3 TA button
4 NEWS/INFO button
5 PTY button
6 ANTENNA button
7 FM MODE button
8 Display window
9 BAND button
10 MEMORY button
11 CHARACTER button
12 MENU button
13 RETURN button
14 TUNE MODE button
15 TUNING/SELECT knob
16 ENTER button
17 Preset buttons
18 SHIFT button
19 CHECK button
20 PROGRAM knob

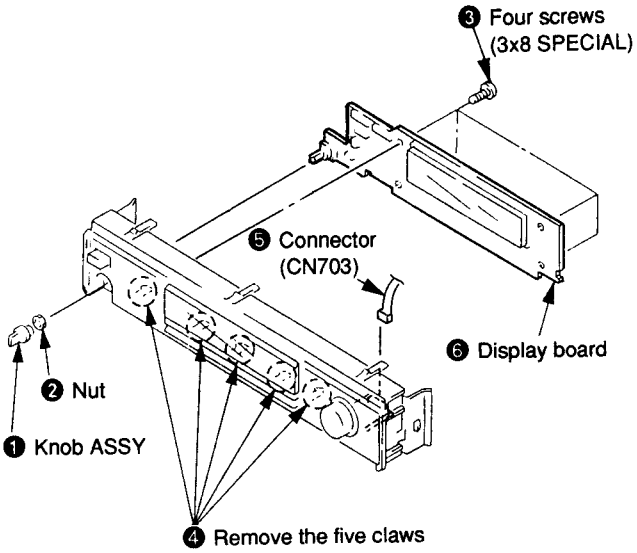
SECTION 2
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

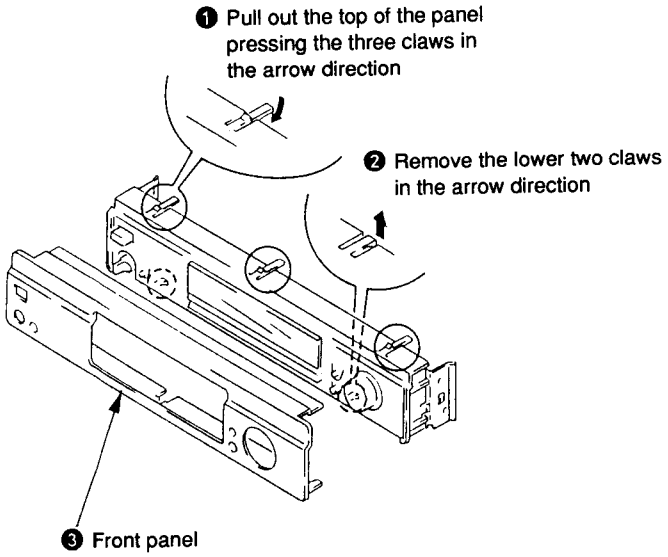
2-1. FRONT PANEL ASSY


❶ Connector (CN902)
❷ Connectors (CN701, CN702)
❺ Front panel ASSY
❹ Remove the two claws pressing in the arrow direction
❸ Three screws (3x8 SPECIAL)

2-2. DISPLAY BOARD



2-3. FRONT PANEL


❶ Pull out the top of the panel pressing the three claws in the arrow direction
❷ Remove the lower two claws in the arrow direction
❸ Front panel

SECTION 3
TEST MODE

1. Circuit Check Mode

Set to the reception frequency that the circuit can STEREO RDS stations. (Set the input level to above 70 dB.)

1. Turn OFF the power.
2. While pressing [4] and [MENU] together, turn ON [POWER].

• The items in the following table will be checked automatically in order every 2 seconds.

Display	Items	DISPLAY		NG
		FM RDS	AM (MW, LW)	
Tuned	$\overline{\text{AST}}$ signal =LOW	OK or NG		IC251 NG, RV251 adjustments
IF Frq	IF COUNT OK	OK or NG	OK or NG	FE101, IC251 NG, or IF count buffer amp (Q251, Q405) NG
Sig Level	SI LEVEL≧70dB	OK or NG	OK or NG	IC221 NG, RV221 adjustments
Stereo	$\overline{\text{ST}}$ signal=LOW	OK or NG		IC301 NG, RV301 adjustments
RDS Signal	RDS DATA OK	OK or NG		IC801 NG

NOTE : The preset data will be erased when this test mode is used. Therefore, take down the data before setting this mode and preset the data again after completing operations in this mode.

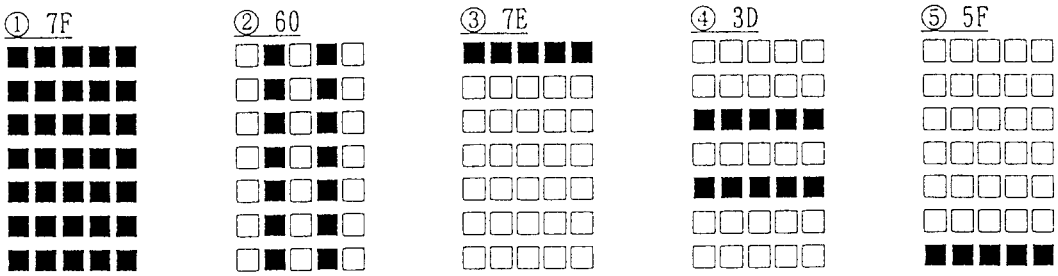
2. Display Tube Check and KEY Check mode

NOTE : Do not perform this check mode when replacing display tubes or excepting when replacing a microcomputer.

1. Turn OFF the power.
2. While pressing [1] and [MENU] together, turn ON [POWER].
3. While continuously pressing [1] and [MENU] together, check the following.

Microcomputer version indication (1 sec)→ All light up "7F" → Dot erea only "60" → Dot erea only "7E" → Dot erea only "3D" → Dot erea only "5F" → (back to start)

Indication test pattern



* The indication test patterns from ② to ⑤ are indicated on only even grids.

The display changes every 1 sec.

4. Release [1] and [MENU]. The KEY CHECK mode will be set.
5. All key numbers will be displayed.
   Key Number : 25
6. Each time the key is pressed, the key number will be counted down.
   Each key will be counted only once, at the first time.
7. When all keys have been pressed, the process will end.

NOTE : As contents of the Factory Preset will be written into memory after completing this check mode, delete contents of memory according to 4. Forced RESET.

3. Entering the Factory Preset (In case perform just to write memory of the Factory Preset.)

1. Turn OFF the power.
2. While pressing [3] and [MENU] together, turn ON [POWER].

4. Forced RESET (Used to delete the contents of Factory Preset when it is written into the preset memory.)

Clears all the RAMs and sets the initial state

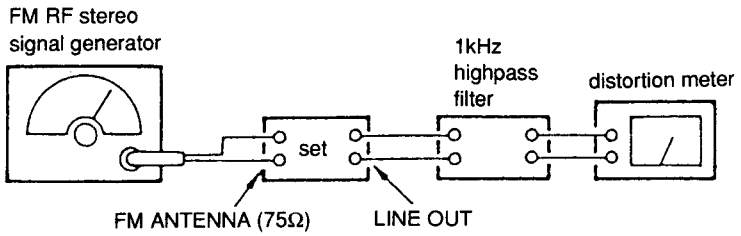
1. Turn OFF the power.
2. While pressing [5] and [MENU] together, turn ON [POWER].

SECTION 4
ELECTRICAL ADJUSTMENTS

Precautions in Repairing

If the front end unit fails, it is difficult to repair the inner circuits, so replace the entire front end unit.

FM SECTION | 0dB = 1μV



- Standard Setting of FM Stereo RF Signal Generator.

STEREO STANDARD SIGNAL	MONAURAL STANDARD SIGNAL
Carrier frequency : 98MHz Modulation : Audio 1kHz Main channel (L+R) : 33.75kHz deviation Sub channel (L–R) : 33.75kHz deviation Pilot : 7.5kHz deviation	Carrier frequency : 98MHz Modulation : Audio 1kHz 75kHz deviation

How to switch IF BAND WIDE/NARROW

Method 1 :

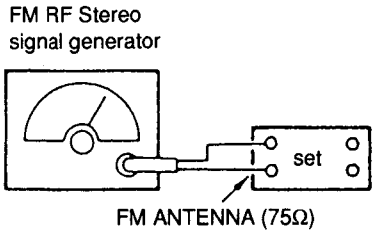
1. Push the MENU key and turn the TUNING/SELECT to indicate "Reception" on the fluorescent display tube, then press the ENTER key.
2. Turn the TUNING/SELECT to indicate "ATT/IF Band" on the fluorescent display tube, then press the ENTER key.
3. Turn the TUNING/SELECT to indicate "ANT ATT: OFF" on the fluorescent display tube, then press the ENTER key.
4. Turn the TUNING/SELECT to indicate "IF: NARROW" or "IF: WIDE" on the fluorescent display tube, then press the ENTER key.
   When the IF BAND: NARROW is set, "NARROW" is indicated on the fluorescent display tube.
5. Set "WIDE" after the all Adjustment.

Method 2 :

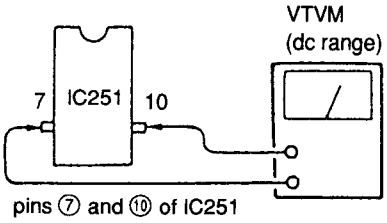
After the test modes "2. Display Tube Check and KEY Check mode" or "3. Entering the Factory Preset", "IF : NARROW" and "IF : WIDE" are switched every time pressing [RETURN] key.
This function does not work if the power is turned off once.
Set "WIDE" after the all adjustments.

Stereo Width Adjustment

Setting :
IF BAND : WIDE



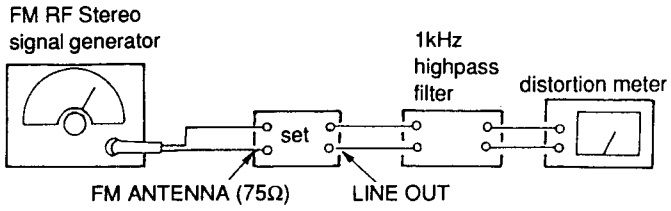
Modulation : Stereo Standard signal
Output level : 6mV (76dBμ) (at 75Ω open)



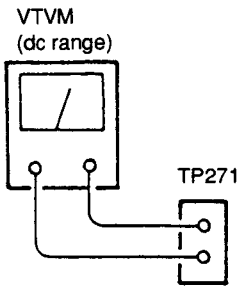
Procedure :
1. Tune the set to 98 MHz.
2. Adjust IFT251 for 0V reading on the VTVM.

NULL/PLL Detect Distortion Adjustment

Setting :
IF BAND : WIDE



Modulation : Monaural Standerd signal

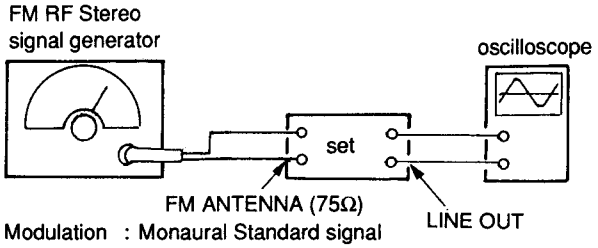


Procedure :
1. Tune the set to 98 MHz.
2. Short-circuit TP201 to the ground (The set turns into IF through state.)
3. Set the SSG output to 6mV (76dBμ).
4. Adjust IFT272 for 0V reading on the VTVM (TP271). (Null adj.)
5. Adjust CT271 for a minimum distortion reading on the distortion meter. (PLL Detect Distortion adj.)
6. Repeat the step 4 and 5 several times.
7. Remove the short circuit of TP201.

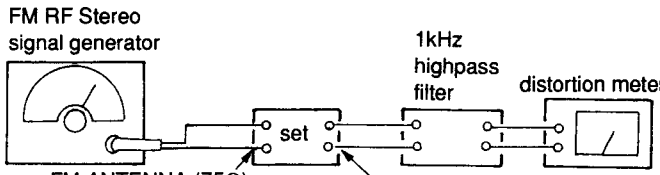
Note : When replacing the ceramic filter perform this alignment.

Front End IFT/STEREO Distortion Rate Adjustment

Setting :
IF BAND : WIDE



Modulation : Monaural Standard signal
Output level : 2.2μV (7dBμ) (at 75Ω open)



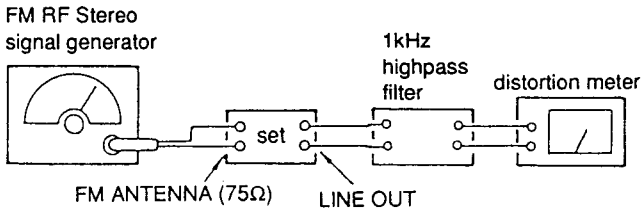
Modulation : Stereo Standard signal
Output level : 6mV (76dBμ) (at 75Ω open)

Procedure :
1. Tune the set to 98 MHz.
2. Remove the top cover of the front end (FE101).
3. Adjust IFT1 of the front end (FE101) to put the noise up-and-down and symmetrically on the waveform of the oscilloscope. (Front End IFT adj.)
4. Adjust the front end (FE101) IFT1 to minimize the STEREO distortion rate. (STEREO Distortion Rate Adj.)
5. Attach the removed top cover of the front end (FE101) as it was.

Note : Do not turn more than a half turn from the core position which is adjusted on the front end IFT adjustment.

Narrow THD Adjustment

Setting :
IF BAND : NARROW

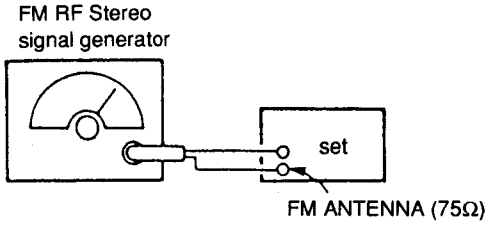


Modulation : Stereo Standard signal
Output level : 10mV (80dBμ) (at 75Ω open)

Procedure :
1. Tune the set to 98 MHz.
2. Set "IF BAND : NARROW" according to the procedure of "How to switch IF BAND WIDE/NARROW" on page 7.
3. Set SSG output level to 80dBμ.
4. Adjust RV232 for a minimum reading on the distortion meter.

Stereo Operation Adjustment

Setting :
IF BAND : WIDE, NARROW

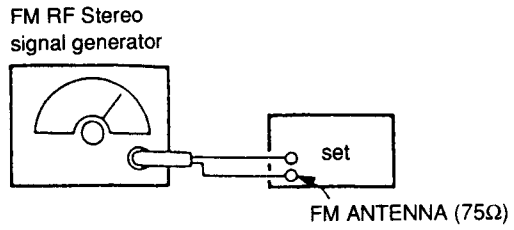


Modulation : Stereo Standard signal
Output level : 17.8μV (25dB) (at 75Ω open)

Procedure :
1. Tune the set to 98 MHz.
2. Set "IF BAND : WIDE" according to the procedure of "How to switch IF BAND WIDE/NARROW" on page 7.
3. Adjust RV251 so that the STEREO indicator goes on.
4. Set "IF BAND : NARROW" according to the procedure of "How to switch IF BAND WIDE/NARROW" on page 7.
5. Adjust RV231 so that the STEREO indicator goes on.

FM Meter Level Adjustment

Setting :
IF BAND : WIDE

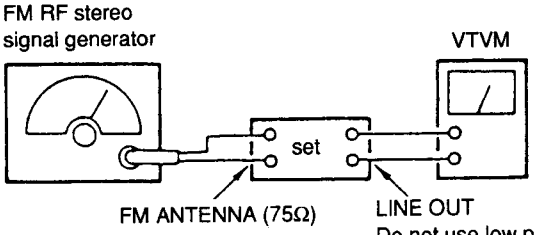


Modulation : Stereo Standard signal
Output level : 6mV (76dBμ) (at 75Ω open)

Procedure :
1. Tune the set to 98 MHz.
2. Press [DISPLAY] key to display the digital signal, then adjust RV221 to be displayed as "SIG 70dB".

Pilot Cancel Adjustment

Setting :
IF BAND : WIDE

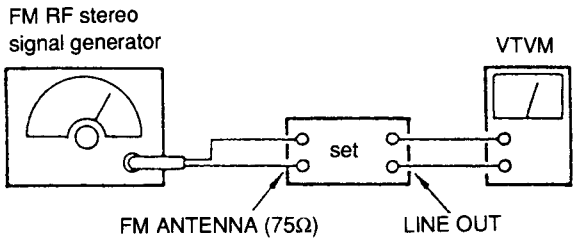


Carrier frequency : 98MHz
Modulation : pilot only
Output level : 10mV (80dBμ) (at 75Ω open)

Procedure :
1. Tune the set to 98 MHz.
2. Adjust RV301 and L301 alternately for minimum reading on the VTVM and also tune the both channel of L-CH and R-CH balanced at this time.
3. Repeat the step 2 several times.

Stereo Separation Adjustment

Setting :
IF BAND : WIDE (WIDE SEPARATION)
IF BAND : NARROW (NARROW SEPARATION)



Modulation : Stereo Standard signal
Output level : 10mV (80dBμ) (at 75Ω open)

Procedure :
1. Refer to "How to switch IF BAND WIDE/NARROW" on page 7.

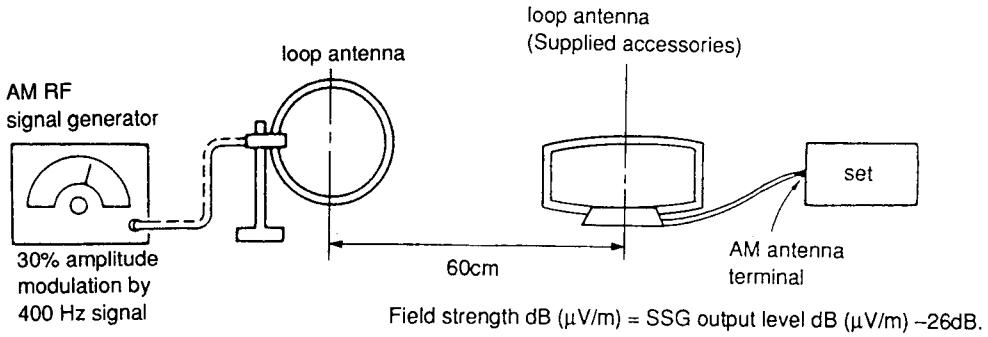
FM stereo Signal generator Output channel	VTVM connection	VTVM reading (dB)
L-CH	L-CH	Ⓐ
R-CH	L-CH	Ⓑ IF BAND WIDE : Adjust RV303 for minimum reading on VTVM IF BAND NARROW : Adjust RV302 for minimum reading on VTVM
R-CH	R-CH	Ⓒ
L-CH	R-CH	Ⓓ IF BAND WIDE : Adjust RV305 for minimum reading on VTVM IF BAND NARROW : Adjust RV304 for minimum reading on VTVM

L-CH Stereo separation : Ⓐ − Ⓑ
R-CH Stereo separation : Ⓒ − Ⓓ

The separations of both channels should be equal.

AM SECTION

Setting :



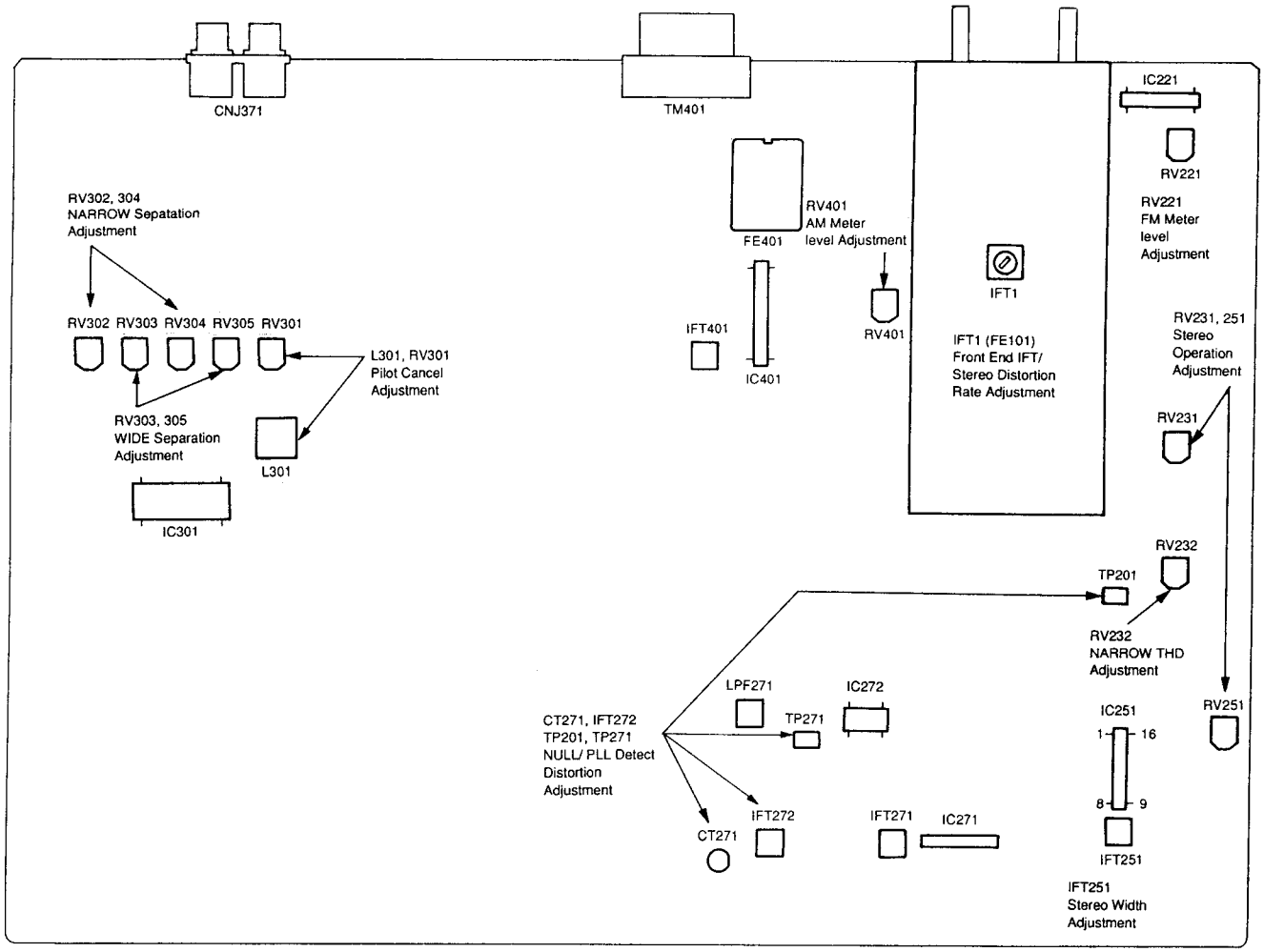
Field strength dB (μV/m) = SSG output level dB (μV/m) –26dB.

AM Meter Level Adjustment

Setting :
Carrier frequency : 216kHz
Modulation : 400Hz, 30% modulation

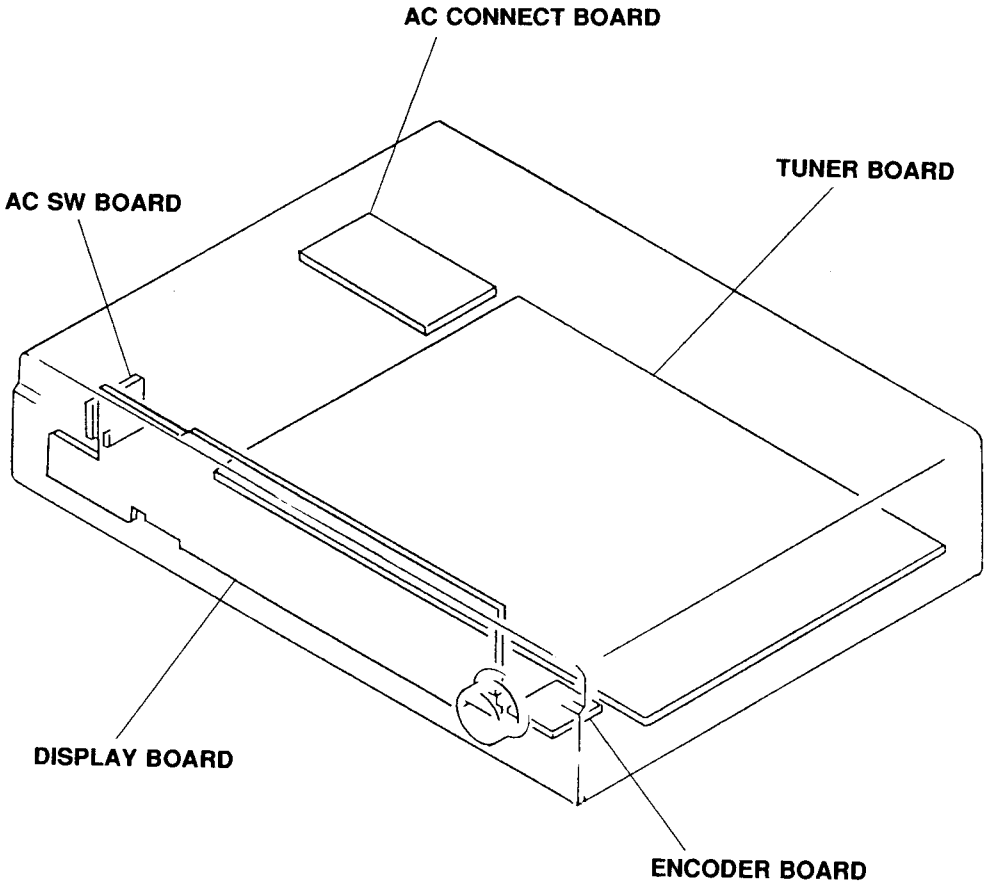
Procedure :
1. Set AM RF signal generator so that the AM antenna input level of the unit becomes 74dBμ/m.
2. Adjust RV401 so that 1 to 16 indication bars light up on the signal meter.

Adjustment Location :



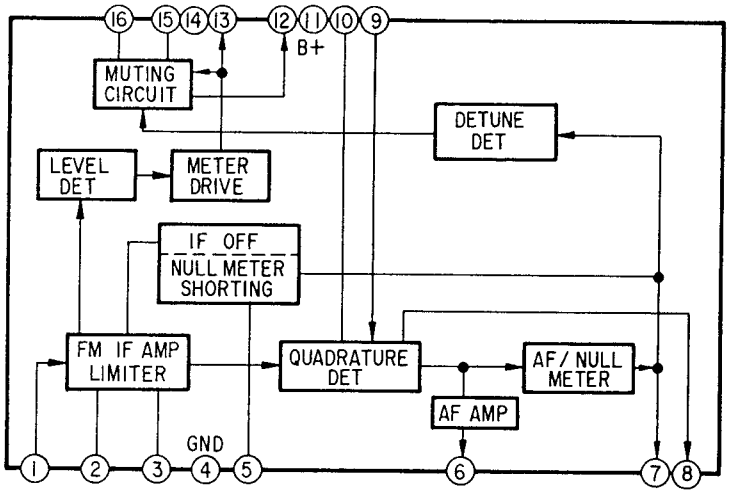
SECTION 5
DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION

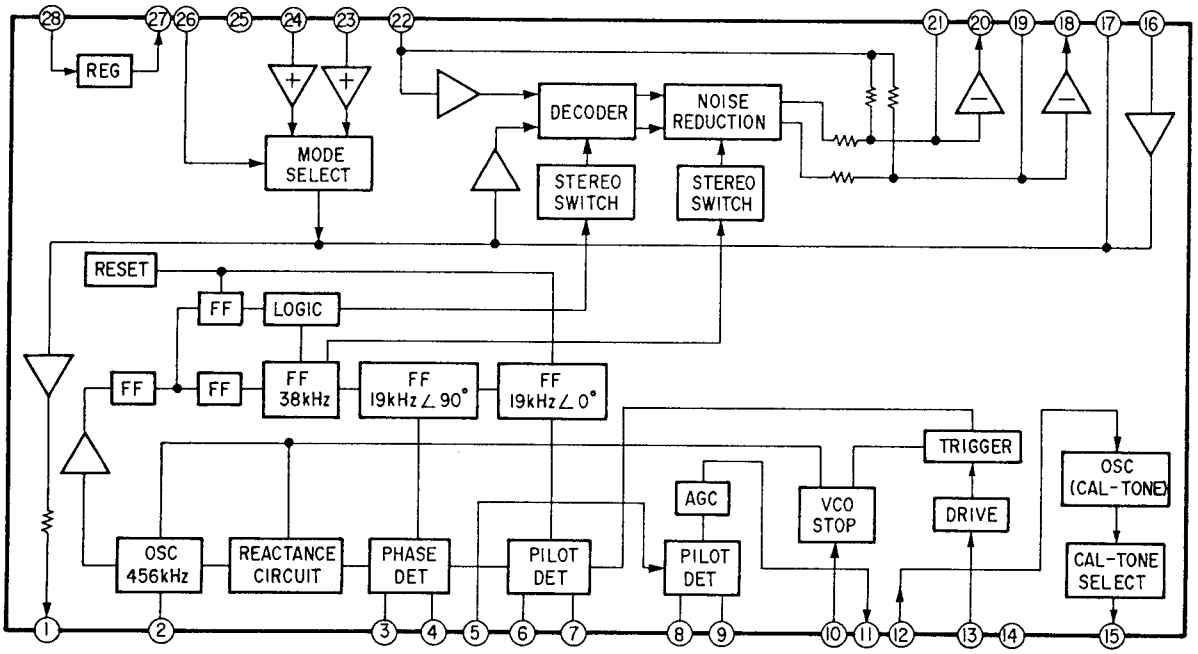


5-2. IC BLOCK DIAGRAMS

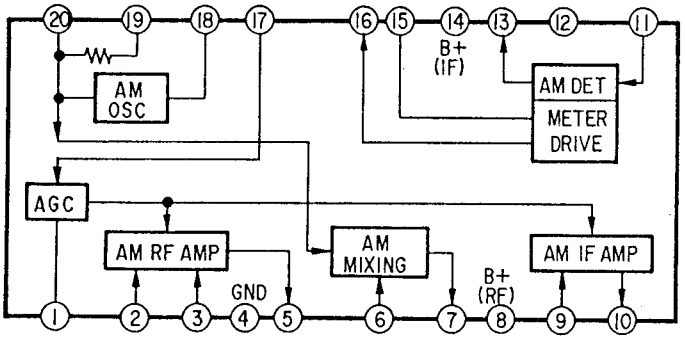
IC221, IC251 LA1235



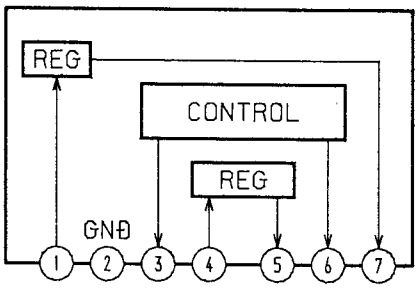
IC301 CXA1064S



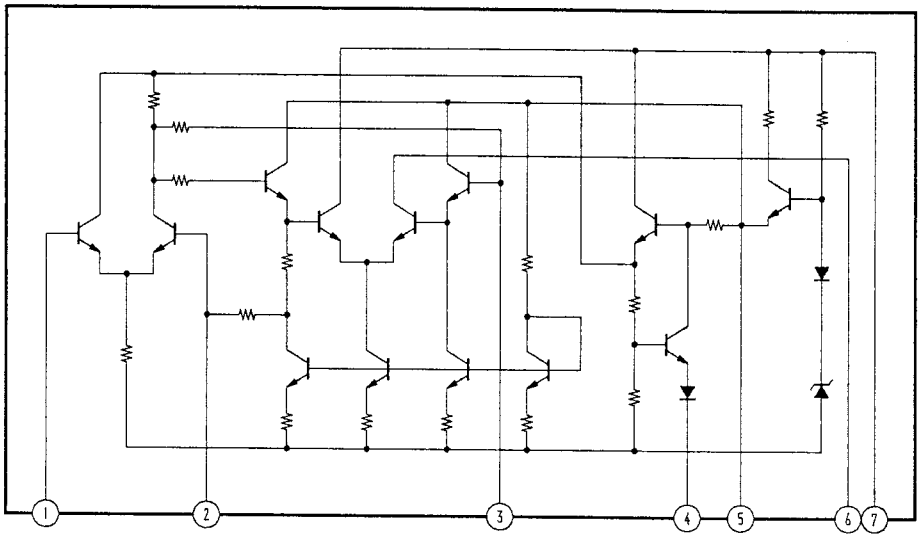
IC401 LA1245



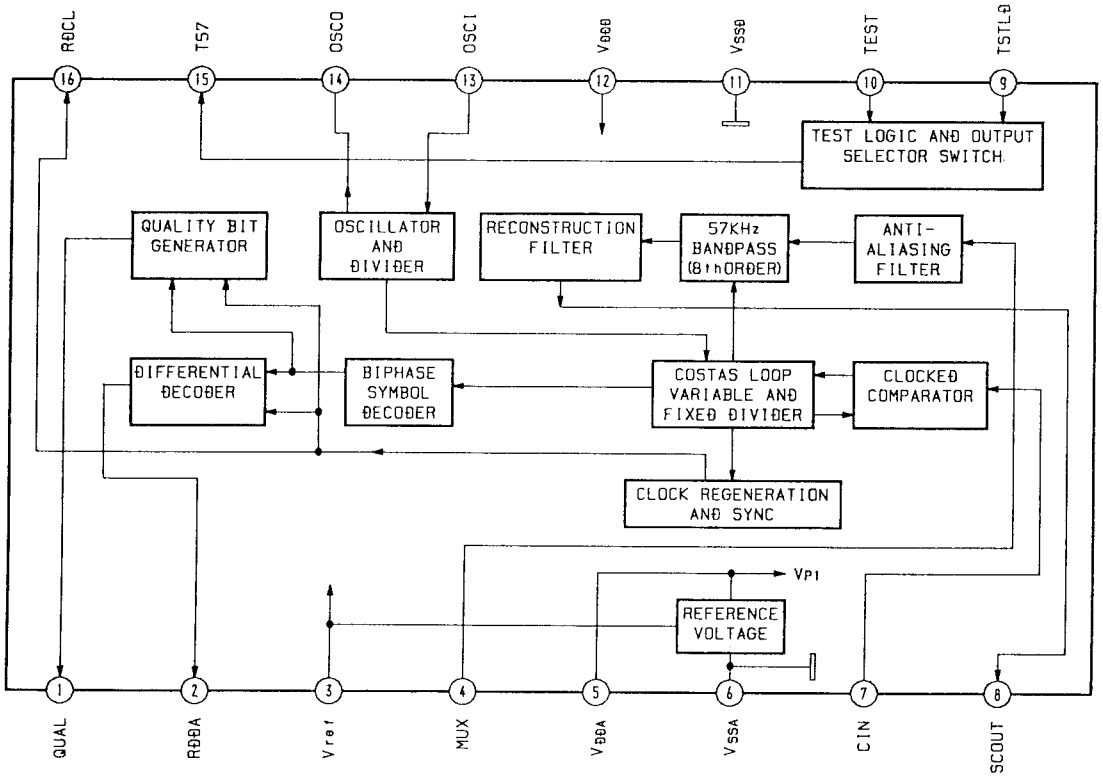
IC951 LA5667



IC271 TA7302P



IC801 SAA6579T



5-3. PRINTED WIRING BOARD — TUNER SECTION —

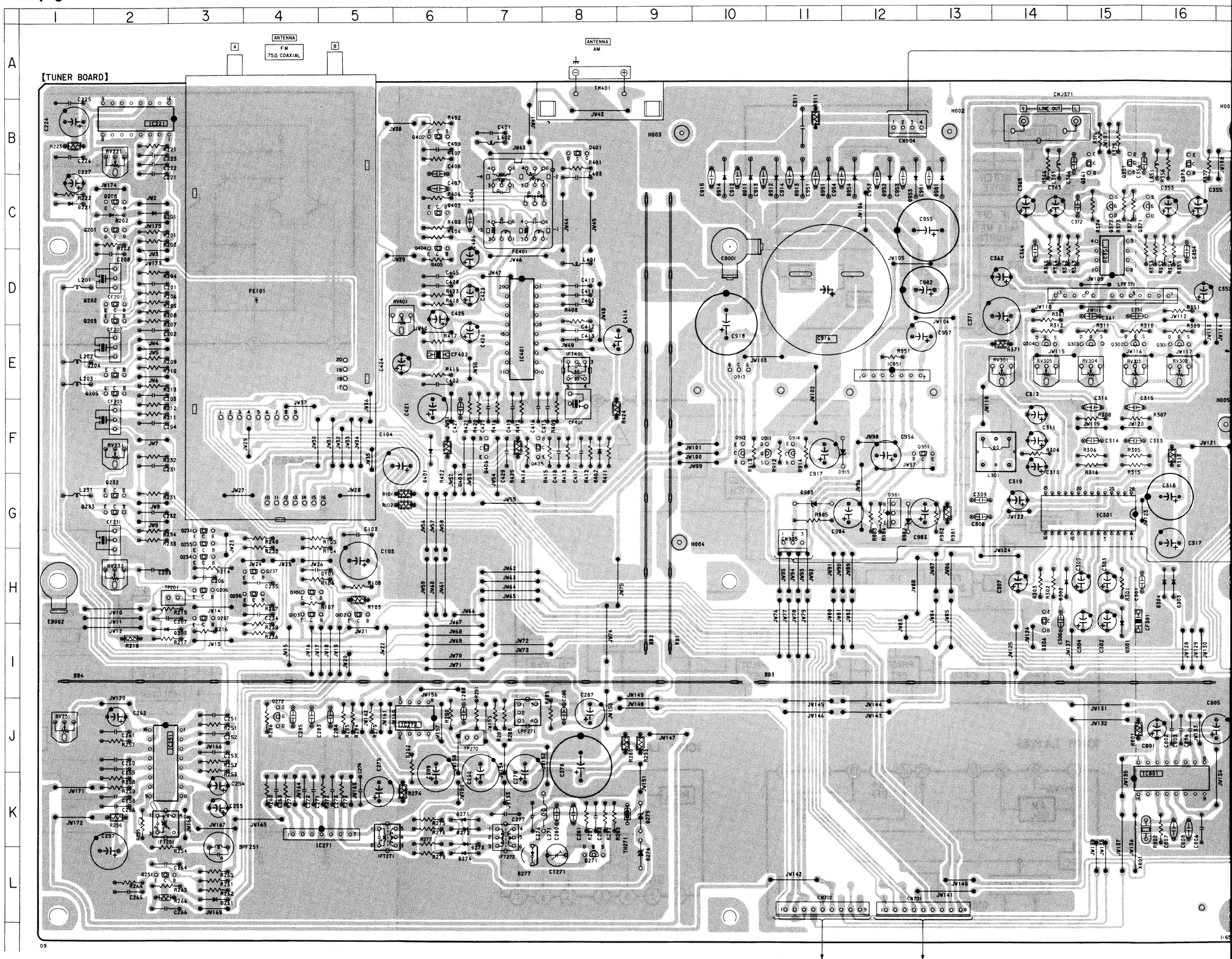
• See page 11 for Circuit Boards Location.

• **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D201	C-2	Q102	H-5
D202	C-2	Q103	H-4
D203	I-3	Q201	C-1
D221	C-1	Q202	D-2
D261	L-3	Q203	D-2
D271	K-6	Q204	E-2
D272	K-6	Q205	E-2
D273	L-6	Q206	H-3
D274	L-6	Q207	H-3
D275	K-9	Q208	C-2
D276	L-9	Q231	G-3
D277	L-7	Q232	G-2
D301	I-15	Q233	G-2
D302	H-14	Q234	H-3
D303	H-16	Q235	G-3
D304	H-16	Q236	H-3
D401	F-6	Q237	H-4
D402	G-8	Q251	L-2
D403	G-6	Q271	L-8
D911	C-10	Q272	J-4
D912	C-11	Q301	E-16
D913	C-11	Q302	E-15
D914	C-10	Q303	E-15
D915	F-11	Q304	E-14
D951	C-11	Q306	I-14
D952	C-12	Q351	C-15
D953	C-12	Q361	C-15
D954	C-12	Q371	C-16
D981	C-13	Q372	C-15
D982	G-12	Q373	C-16
D983	G-11	Q401	B-8
		Q402	B-6
IC221	B-2	Q403	C-6
IC251	J-2	Q404	C-6
IC271	K-4	Q405	F-7
IC272	J-6	Q406	F-7
IC301	G-15	Q911	F-10
IC351	D-15	Q912	F-10
IC401	E-7	Q913	E-10
IC801	K-16	Q914	F-11
IC951	E-12	Q951	F-12
		Q981	G-12
Q101	H-4		

Note:

- ○—— : parts extracted from the component side.
- △ : internal component.
- ▒▒ : Pattern from the side which enable seeing.



5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21

ANTENNA AM

TN401

JW42

CN904

CNJ371 LINE OUT

PT901 POWER TRANSFORMER

BLU GRY BLU BLK ORG RED RED

【AC CONNECT BOARD】

RED WHT

CN901 CN902 C901

BLU BRN

PC901 AC IN

I-656-418-

CNP902

POWER ON OFF

I-656-417-

【AC SW BOARD】

EB001

LPF371

IC401 IC951 IC301 IC801

RV301 RV302 RV303 RV304 RV305

L301 L271

IFT271 IFT272 IFT401

CT271 CT301

LPF271

TP270

CF401 CF402

CN905 CN906 CN907 CN908

CN702 CN701

TO DISPLAY BOARD CNP702 (B)

TO DISPLAY BOARD CNP701 (A)

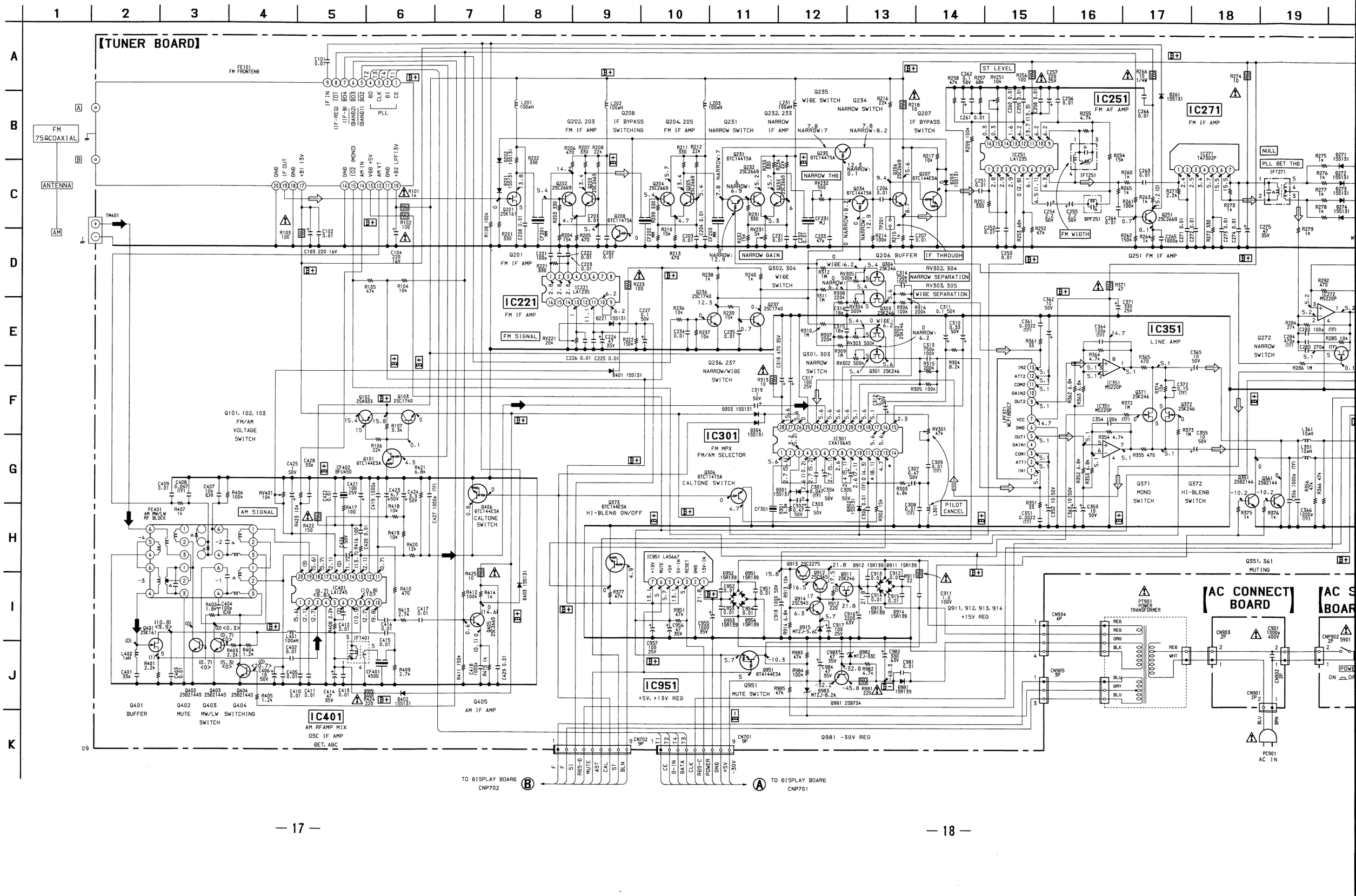
I-656-219-

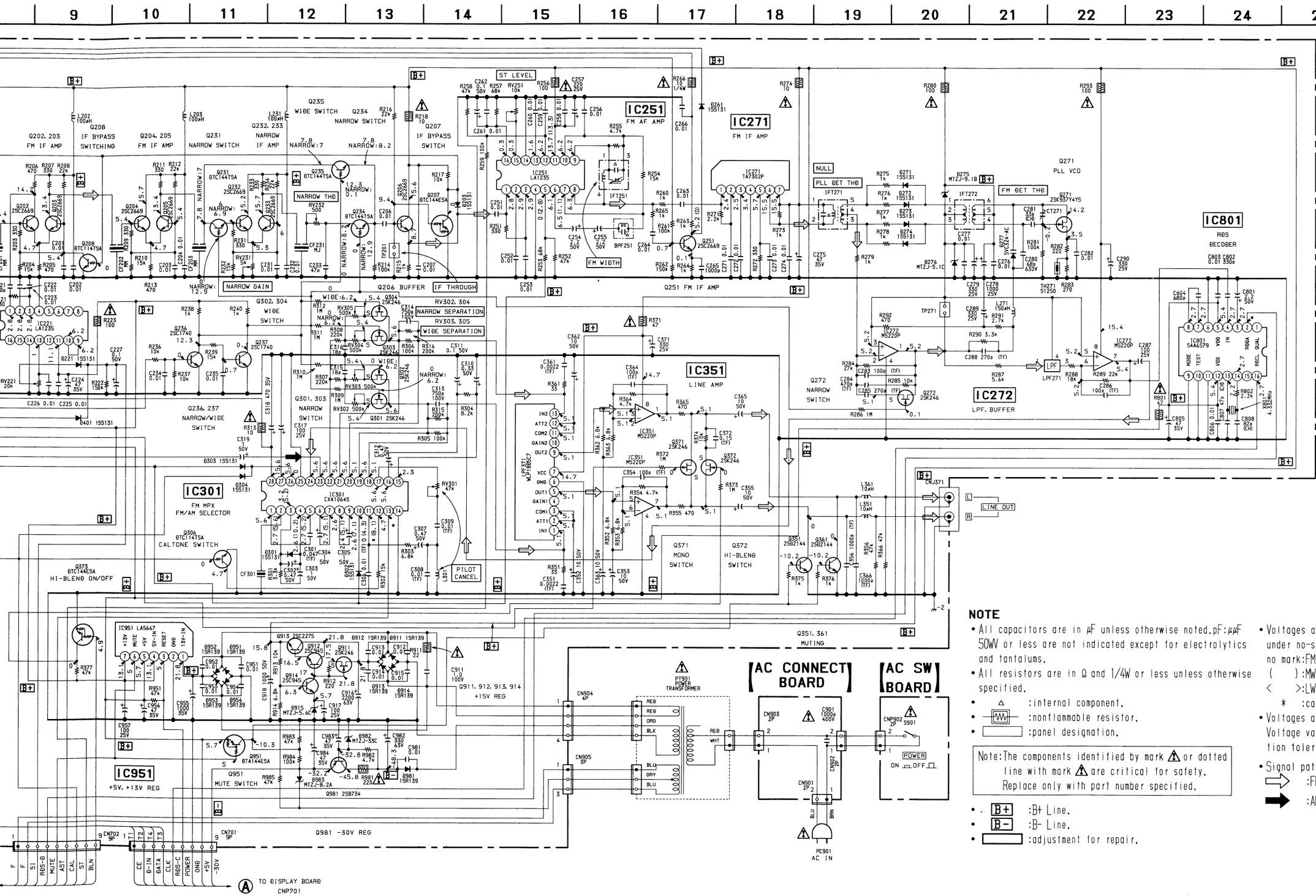
— 15 —

— 16 —

5-4. SCHEMATIC DIAGRAM — TUNER SECTION —

• See page 12 for IC Block Diagrams.





NOTE

- All capacitors are in μF unless otherwise noted. pF: μμF
  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- :nonflammable resistor.
- :panel designation.

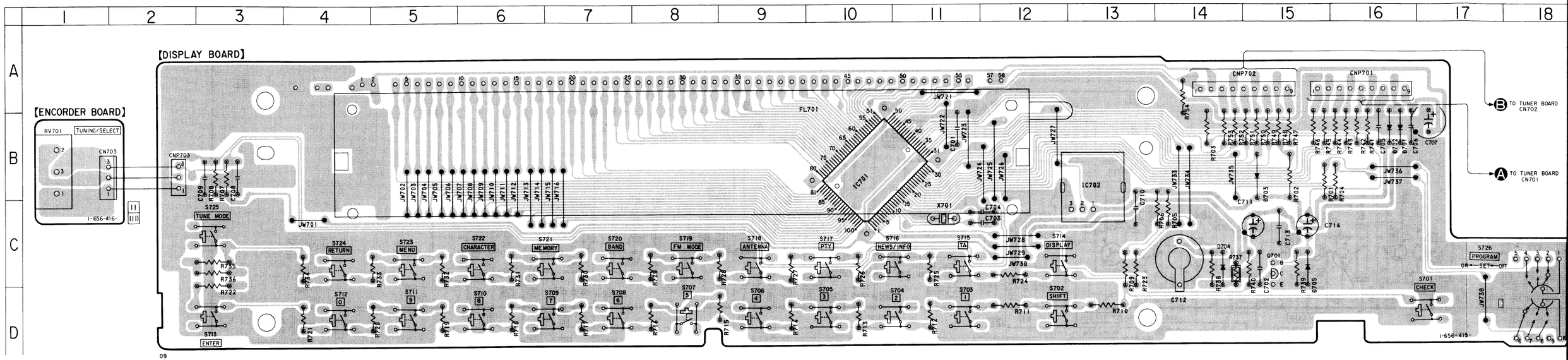
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- B+ :B+ Line.
- B- :B- Line.
- :adjustment for repair.

- Voltages and waveforms are dc with respect to ground under no-signal (deturned) conditions.
  no mark: FM
  ( ): MW
  < >: LW
  * : can not be measured.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ :FM
  ➡ :AM

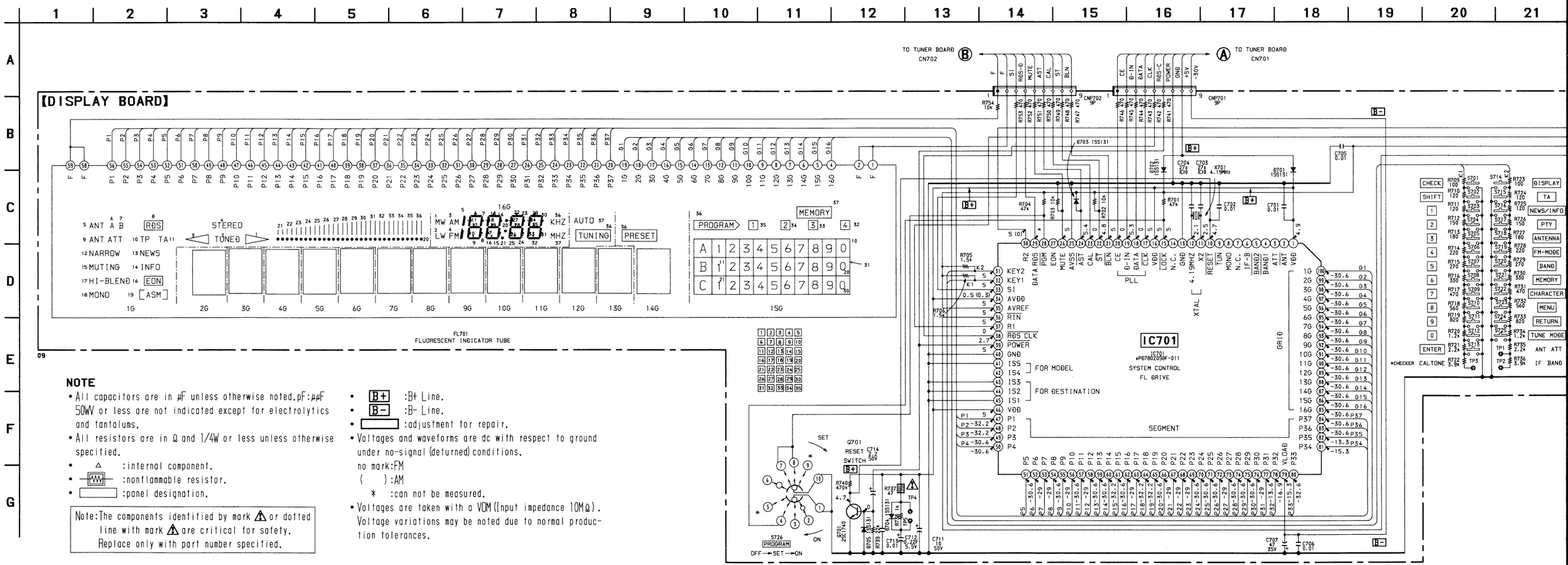
5-5. PRINTED WIRING BOARD — DISPLAY SECTION —

• See page 11 for Circuit Boards Location.



5-6. SCHEMATIC DIAGRAM — DISPLAY SECTION —

• See page 23 for IC Pin Function. (IC701)

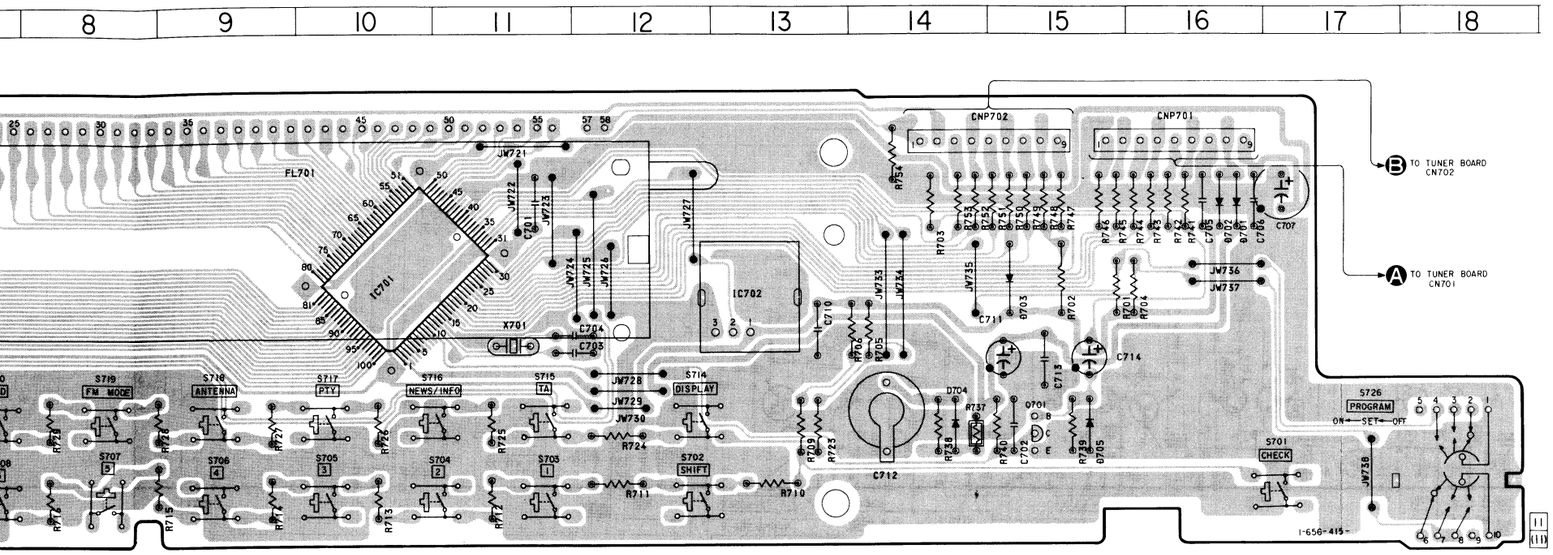


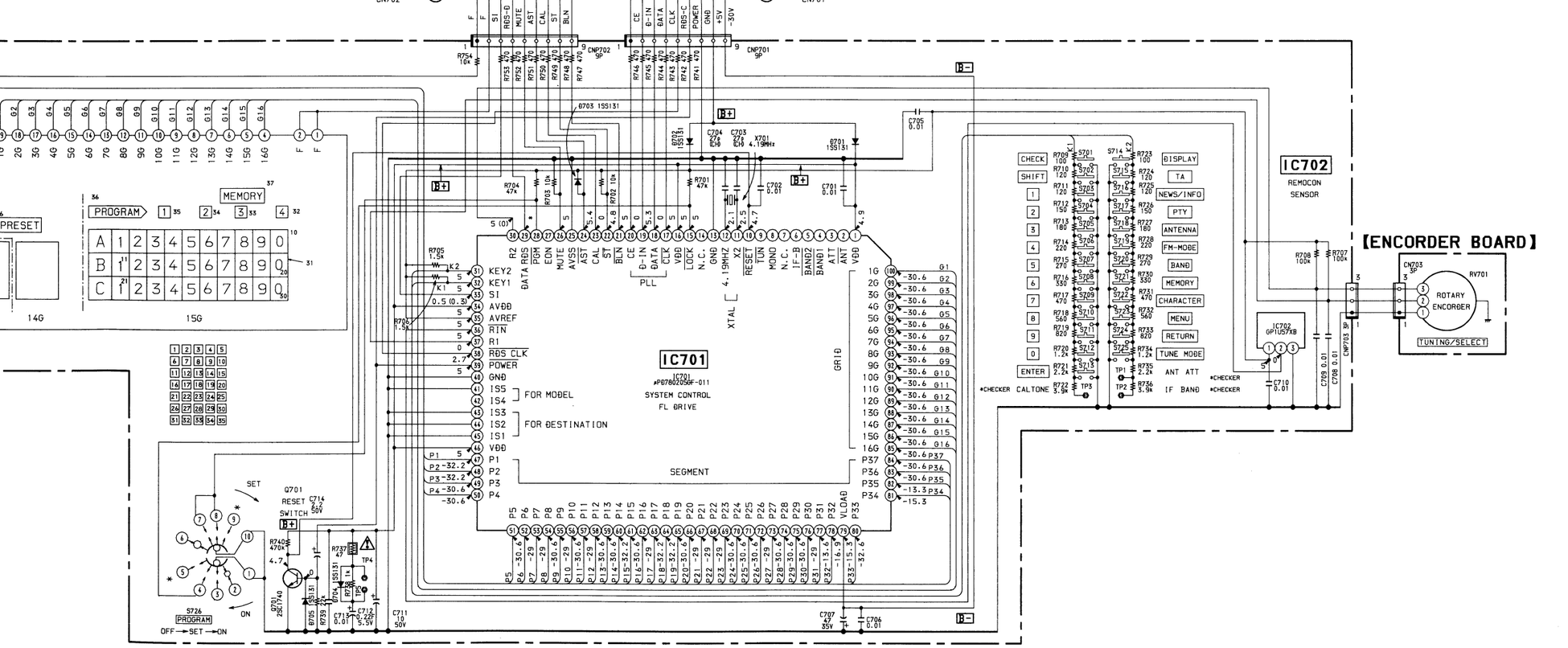
NOTE

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- ▭ :nonflammable resistor.
- ▭ :panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- B+ :B+ Line.
- B− :B− Line.
- ▭ :adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (deturned) conditions.
  no mark: FM
  ( ): AM
  * : can not be measured.
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.





- **Semiconductor Location**

Ref. No.	Location
D701	B-16
D702	B-16
D703	B-15
D704	C-14
D705	C-15
IC701	B-10
IC702	B-13
Q701	C-15

Note:

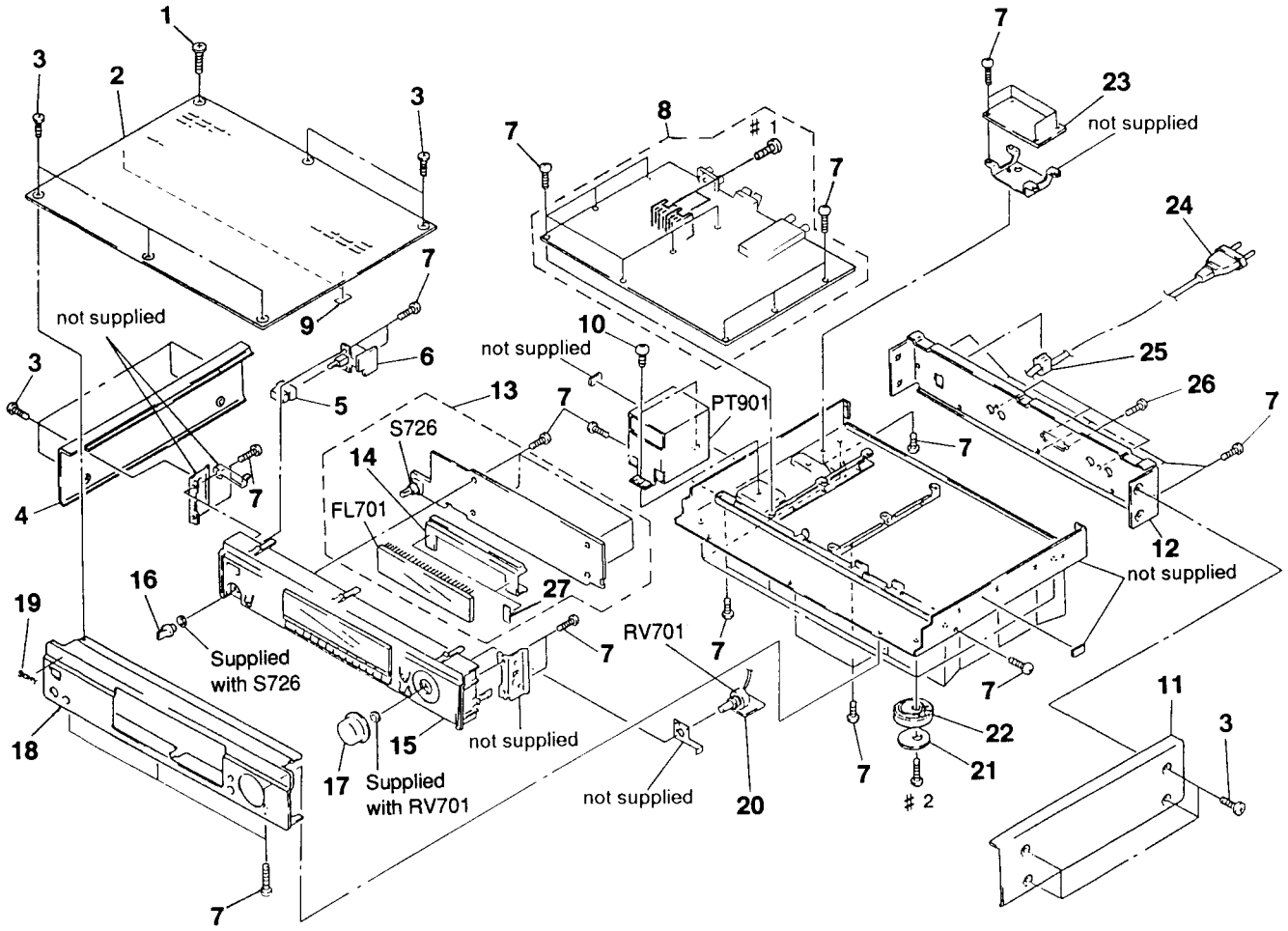
- ○—— : parts extracted from the component side.
- ▒▒ : Pattern from the side which enable seeing.

SECTION 6
EXPLODED VIEW

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts color ↑ Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  G : German model

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.



Ref. No.	Part No.	Description	Remark
1	4-921-439-11	SCREW (M3X8), FLAT HEAD (SILVER).. (GOLD)	
1	4-921-439-21	SCREW (M3X8), FLAT HEAD (BLACK).. (BLACK)	
2	4-970-687-21	PLATE, TOP (BLACK)	
2	4-970-687-31	PLATE, TOP (GOLD)	
3	4-924-242-11	SCREW (M3X6), FLAT HEAD (BLACK).. (BLACK)	
3	4-924-242-61	SCREW (M3X6), FLAT HEAD (SILVER).. (GOLD)	
4	4-970-685-01	PANEL (L), SIDE (BLACK)	
4	4-970-685-11	PANEL (L), SIDE (GOLD)	
5	4-917-460-01	KNOB, POWER (BLACK)	
5	4-917-460-51	KNOB, POWER (GOLD)	
* 6	1-656-417-11	AC SW BOARD	
7	4-967-961-01	SCREW (3X8) (SPECIAL)	
* 8	A-4377-990-A	TUNER BOARD, COMPLETE	
9	3-849-226-01	CLOTH, UNWEAVED (25X6X0.5)	
10	4-967-960-01	SCREW (4X8)	
11	4-970-686-01	PANEL (R), SIDE (BLACK)	
11	4-970-686-11	PANEL (R), SIDE (GOLD)	
* 12	4-974-313-01	PANEL, BACK	
* 13	A-4377-986-A	DISPLAY BOARD, COMPLETE	
* 14	4-952-115-01	HOLDER, FL TUBE	
15	X-4946-074-1	BASE ASSY (B/5), PANEL (BLACK)	
15	X-4946-075-1	BASE ASSY (N/5), PANEL (GOLD)	
16	X-4943-846-1	KNOB ASSY (B) (BLACK)	
16	X-4943-847-1	KNOB ASSY (N) (GOLD)	
17	4-970-684-01	KNOB (T) (BLACK)	
17	4-970-684-11	KNOB (T) (GOLD)	
18	4-970-683-31	PANEL, FRONT (BLACK)	
18	4-970-683-41	PANEL, FRONT (GOLD)	
19	4-942-568-01	EMBLEM (NO. 5), SONY (SILVER).. (BLACK)	
19	4-942-568-21	EMBLEM (NO. 5), SONY (GOLD).. (GOLD)	
* 20	1-656-416-11	ENCODER BOARD	
21	4-970-124-01	CUSHION (F50180S)	
22	4-970-123-01	FOOT (F50180S)	
* 23	1-656-418-11	AC CONNECT BOARD	
⚠24	1-575-651-21	CORD, POWER	
25	3-703-244-00	BUSHING, CORD	
26	3-704-515-41	SCREW (BV/RING)	
* 27	4-921-941-81	CUSHION (FL)	
FL701	1-517-427-11	INDICATOR TUBE, FLUORESCENT	
⚠PT901	1-450-409-21	TRANSFORMER, POWER	
RV701	1-467-927-11	ENCODER, ROTARY (TUNING/SELECT)	
S726	1-762-199-11	SWITCH, ROTARY (PROGRAM)	

5-7. IC PIN FUNCTION

- **IC701 μPD780205GF (SYSTEM CONTROL, FL DRIVE)**

Pin No.	Pin Name	I/O	Function
1	VDD	–	Power supply (+5V)
2	$\overline{\text{ANT}}$	O	ANT A/$\overline{\text{B}}$ switching output (open)
3	ATT	O	ANT ATT on/$\overline{\text{off}}$ switching output (open)
4	$\overline{\text{BAND1}}$	O	FM/$\overline{\text{AM}}$ BAND switching output (open)
5	$\overline{\text{BAND2}}$	O	AM BAND $\overline{\text{MW}}$/LW switching output (open)
6	IF-B	O	IF BAND $\overline{\text{WIDE}}$/NARROW switching output (open)
7	NC	–	Not used (open)
8	MONO	O	Forced FM MONO on/$\overline{\text{off}}$ output (open)
9	$\overline{\text{TUN}}$	O	TUNING action detection output (open)
10	$\overline{\text{RESET}}$	I	System reset input
11	4.19	O	Main system clock (4.19 MHz)
12	4.19	I	
13	GND	I	Single chip MODE select input (GND)
14	NC	–	Not used (open)
15	$\overline{\text{LOCK}}$	I	PROGRAM SW $\overline{\text{on}}$/off detection input
16	VDD	–	Power supply (+5V)
17	PLL $\overline{\text{CLK}}$	O	Serial clock output for PLL LC72130
18	PLL DATA	O	Serial data output for PLL LC72130
19	PLL DIN	I	IF COUNT data input and PLL condition detection
20	PLL CE	O	CE signal output for PLL LC72130
21	$\overline{\text{BLN}}$	O	HI-BLEND on/$\overline{\text{off}}$ switching output
22	$\overline{\text{ST}}$	I	STEREO display detection input
23	CAL	O	CAL TONE on/$\overline{\text{off}}$ switching output
24	$\overline{\text{AST}}$	I	AUTO STOP signal detection input
25	AVss	–	GND of the A/D converter
26	$\overline{\text{MUTE}}$	O	Muting signal on/off switching output
27	EON	O	Receive Reception, outside control output
28	$\overline{\text{PGM}}$	I	PROGRAM SW $\overline{\text{SET}}$/OFF detection input
29	RDS DATA	I	RDS DATA input
30	R2	I	Rotary encorder phase detection input
31, 32	KEY2, KEY1	I	Key input
33	SI	I	SIGNAL LEVEL input
34	AVDD	–	Analog power supply of the A/D converter (+5V)
35	AVREF	I	Reference voltage of the A/D converter (+5V)
36	$\overline{\text{RIN}}$	I	Remote controller signal input
37	R1	I	Rotary encorder number of rotations detection input
38	$\overline{\text{RDS CLK}}$	I	Clock input for RDS DATA from SAA6579T
39	$\overline{\text{POWER}}$	I	Power on/$\overline{\text{off}}$ monitor input
40	Vss	–	System GND
41, 42	IS5, IS4	I	Model and function setting input
43 to 45	IS3 to IS1	I	Destination setting input
46	VDD	–	Power supply (+5V)
47 to 78	P1 to P32	O	Segment signal output to the FL tube (FL701)
79	VLOAD	–	Power supply to the FL tube (FL701) (–30V)
80 to 84	P33 to P37	O	Segment signal output to the FL tube (FL701)
85 to 100	16G to 1G	O	Grid signal output to the FL tube (FL701)

SECTION 7
ELECTRICAL PARTS LIST

AC CONNECT

AC SW **DISPLAY**

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH
- Abbreviation
  G : German model

Ref.No.	Part No.	Description			Remark
*	1-656-418-11	AC CONNECT BOARD			
		**********			
		< CAPACITOR >			
⚠C901	1-161-741-00	CERAMIC	0.001uF	10% 400V	
		< CONNECTOR >			
CN901	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
* CN902	1-565-792-11	PIN, CONNECTOR 2P			
CN903	1-564-321-00	PIN, CONNECTOR 2P			
**********					
*	1-656-417-11	AC SW BOARD			
		**********			
		< SWITCH >			
⚠S901	1-572-267-51	SWITCH, PUSH (AC POWER) (1 KEY) (POWER)			
**********					
*	A-4377-986-A	DISPLAY BOARD, COMPLETE			
		**********			
*	4-921-941-81	CUSHION (FL)			
*	4-952-115-01	HOLDER, FL TUBE			
		< CAPACITOR >			
C701	1-162-306-11	CERAMIC	0.01uF	30% 16V	
C702	1-162-306-11	CERAMIC	0.01uF	30% 16V	
C703	1-162-209-31	CERAMIC	27PF	5% 50V	
C704	1-162-209-31	CERAMIC	27PF	5% 50V	
C705	1-162-306-11	CERAMIC	0.01uF	30% 16V	
C706	1-162-306-11	CERAMIC	0.01uF	30% 16V	
C707	1-126-051-11	ELECT	47uF	20% 35V	
C708	1-162-306-11	CERAMIC	0.01uF	30% 16V	
C709	1-162-306-11	CERAMIC	0.01uF	30% 16V	
C710	1-162-306-11	CERAMIC	0.01uF	30% 16V	
C711	1-126-059-11	ELECT	10uF	20% 50V	
C712	1-104-905-11	DOUBLE LAYERS	0.22F	5.5V	
C713	1-162-306-11	CERAMIC	0.01uF	30% 16V	
C714	1-126-045-11	ELECT	2.2uF	20% 50V	

Ref.No.	Part No.	Description			Remark
		< DIODE >			
D701	8-719-815-85	DIODE 1S1585			
D702	8-719-815-85	DIODE 1S1585			
D703	8-719-815-85	DIODE 1S1585			
D704	8-719-815-85	DIODE 1S1585			
D705	8-719-815-85	DIODE 1S1585			
		< FLUORESCENT INDICATOR >			
FL701	1-517-427-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC701	8-759-338-20	IC uPD780205GF-011-3B9			
IC702	8-749-923-43	IC GP1U57XB			
		< TRANSISTOR >			
Q701	8-729-119-78	TRANSISTOR 2SC2785-HFE			
		< RESISTOR >			
R701	1-249-437-11	CARBON	47K	5% 1/4W	
R702	1-249-429-11	CARBON	10K	5% 1/4W	
R703	1-249-429-11	CARBON	10K	5% 1/4W	
R704	1-249-437-11	CARBON	47K	5% 1/4W	
R705	1-249-419-11	CARBON	1.5K	5% 1/4W	F
R706	1-249-419-11	CARBON	1.5K	5% 1/4W	F
R707	1-249-441-11	CARBON	100K	5% 1/4W	
R708	1-249-441-11	CARBON	100K	5% 1/4W	
R709	1-247-807-31	CARBON	100	5% 1/4W	
R710	1-249-406-11	CARBON	120	5% 1/4W	F
R711	1-249-406-11	CARBON	120	5% 1/4W	F
R712	1-249-407-11	CARBON	150	5% 1/4W	F
R713	1-249-408-11	CARBON	180	5% 1/4W	F
R714	1-247-815-91	CARBON	220	5% 1/4W	
R715	1-249-410-11	CARBON	270	5% 1/4W	F
R716	1-249-411-11	CARBON	330	5% 1/4W	
R717	1-249-413-11	CARBON	470	5% 1/4W	F
R718	1-249-414-11	CARBON	560	5% 1/4W	F
R719	1-249-416-11	CARBON	820	5% 1/4W	F
R720	1-249-418-11	CARBON	1.2K	5% 1/4W	F
R721	1-249-421-11	CARBON	2.2K	5% 1/4W	F
R722	1-249-424-11	CARBON	3.9K	5% 1/4W	F
R723	1-247-807-31	CARBON	100	5% 1/4W	
R724	1-249-406-11	CARBON	120	5% 1/4W	F

DISPLAY ENCODER TUNER

Ref.No.	Part No.	Description				Remark
R725	1-249-406-11	CARBON	120	5%	1/4W	F
R726	1-249-407-11	CARBON	150	5%	1/4W	F
R727	1-249-408-11	CARBON	180	5%	1/4W	F
R728	1-247-815-91	CARBON	220	5%	1/4W	
R729	1-249-410-11	CARBON	270	5%	1/4W	F
R730	1-249-411-11	CARBON	330	5%	1/4W	
R731	1-249-413-11	CARBON	470	5%	1/4W	F
R732	1-249-414-11	CARBON	560	5%	1/4W	F
R733	1-249-416-11	CARBON	820	5%	1/4W	F
R734	1-249-418-11	CARBON	1.2K	5%	1/4W	F
R735	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R736	1-249-424-11	CARBON	3.9K	5%	1/4W	F
⚠R737	1-249-401-11	CARBON	47	5%	1/4W	F
R738	1-249-417-11	CARBON	1K	5%	1/4W	F
R739	1-249-433-11	CARBON	22K	5%	1/4W	
R740	1-247-895-00	CARBON	470K	5%	1/4W	
R741	1-249-413-11	CARBON	470	5%	1/4W	F
R742	1-249-413-11	CARBON	470	5%	1/4W	F
R743	1-249-413-11	CARBON	470	5%	1/4W	F
R744	1-249-413-11	CARBON	470	5%	1/4W	F
R745	1-249-413-11	CARBON	470	5%	1/4W	F
R746	1-249-413-11	CARBON	470	5%	1/4W	F
R747	1-249-413-11	CARBON	470	5%	1/4W	F
R748	1-249-413-11	CARBON	470	5%	1/4W	F
R749	1-249-413-11	CARBON	470	5%	1/4W	F
R750	1-249-413-11	CARBON	470	5%	1/4W	F
R751	1-249-413-11	CARBON	470	5%	1/4W	F
R752	1-249-413-11	CARBON	470	5%	1/4W	F
R753	1-249-413-11	CARBON	470	5%	1/4W	F
R754	1-249-429-11	CARBON	10K	5%	1/4W	
		< SWITCH >				
S701	1-554-303-21	SWITCH, TACTILE (CHECK)				
S702	1-554-303-21	SWITCH, TACTILE (SHIFT)				
S703	1-554-303-21	SWITCH, TACTILE (1)				
S704	1-554-303-21	SWITCH, TACTILE (2)				
S705	1-554-303-21	SWITCH, TACTILE (3)				
S706	1-554-303-21	SWITCH, TACTILE (4)				
S707	1-554-303-21	SWITCH, TACTILE (5)				
S708	1-554-303-21	SWITCH, TACTILE (6)				
S709	1-554-303-21	SWITCH, TACTILE (7)				
S710	1-554-303-21	SWITCH, TACTILE (8)				
S711	1-554-303-21	SWITCH, TACTILE (9)				
S712	1-554-303-21	SWITCH, TACTILE (0)				
S713	1-554-303-21	SWITCH, TACTILE (ENTER)				
S714	1-554-303-21	SWITCH, TACTILE (DISPLAY)				
S715	1-554-303-21	SWITCH, TACTILE (TA)				
S716	1-554-303-21	SWITCH, TACTILE (NEWS/INFO)				
S717	1-554-303-21	SWITCH, TACTILE (PTY)				
S718	1-554-303-21	SWITCH, TACTILE (ANTENNA)				
S719	1-554-303-21	SWITCH, TACTILE (FM MODE)				
S720	1-554-303-21	SWITCH, TACTILE (BAND)				
S721	1-554-303-21	SWITCH, TACTILE (MEMORY)				
S722	1-554-303-21	SWITCH, TACTILE (CHARACTER)				
S723	1-554-303-21	SWITCH, TACTILE (MENU)				
S724	1-554-303-21	SWITCH, TACTILE (RETURN)				
S725	1-554-303-21	SWITCH, TACTILE (TUNE MODE)				
S726	1-762-199-11	SWITCH, ROTARY (PROGRAM)				
		< VIBRATOR >				
X701	1-760-422-11	VIBRATOR, CRYSTAL (4.19MHz)				
**********						
*	1-656-416-11	ENCODER BOARD				
		**********				
		< CONNECTOR >				
CN703	1-766-276-11	PIN, CONNECTOR (PC BOARD) 3P				
		< VARIABLE RESISTOR >				
RV701	1-467-927-11	ENCODER, ROTARY (TUNING/SELECT)				
**********						
*	A-4377-990-A	TUNER BOARD, COMPLETE				
		**********				
	7-682-548-09	SCREW (3X8)				
		< BUS BAR >				
* BB1	1-560-242-51	BUS BAR 7P				
* BB2	1-560-242-51	BUS BAR 7P				
* BB3	1-560-242-51	BUS BAR 7P				
* BB4	1-560-242-91	BUS BAR 10P				
		< BPF >				
BPF251	1-235-046-00	ENCAPSULATED COMPONENT (B.E.F)				
		< CAPACITOR >				
C101	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C102	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C103	1-124-120-11	ELECT	220uF	20%	25V	
C104	1-124-120-11	ELECT	220uF	20%	25V	
C201	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C202	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C203	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C204	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C206	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C207	1-162-306-11	CERAMIC	0.01uF	30%	16V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
C208	1-162-306-11	CERAMIC	0.01uF	30%	16V
C221	1-162-282-31	CERAMIC	100PF	10%	50V
C222	1-162-306-11	CERAMIC	0.01uF	30%	16V
C223	1-162-306-11	CERAMIC	0.01uF	30%	16V
C224	1-124-918-11	ELECT	47uF	20%	63V
C225	1-162-306-11	CERAMIC	0.01uF	30%	16V
C226	1-162-306-11	CERAMIC	0.01uF	30%	16V
C227	1-124-463-00	ELECT	0.1uF	20%	50V
C231	1-162-306-11	CERAMIC	0.01uF	30%	16V
C232	1-162-306-11	CERAMIC	0.01uF	30%	16V
C233	1-162-215-31	CERAMIC	47PF	5%	50V
C234	1-162-306-11	CERAMIC	0.01uF	30%	16V
C235	1-162-306-11	CERAMIC	0.01uF	30%	16V
C251	1-162-306-11	CERAMIC	0.01uF	30%	16V
C252	1-162-306-11	CERAMIC	0.01uF	30%	16V
C253	1-162-306-11	CERAMIC	0.01uF	30%	16V
C254	1-124-925-11	ELECT	2.2uF	20%	100V
C255	1-124-925-11	ELECT	2.2uF	20%	100V
C256	1-162-306-11	CERAMIC	0.01uF	30%	16V
C257	1-124-911-11	ELECT	220uF	20%	50V
C258	1-162-306-11	CERAMIC	0.01uF	30%	16V
C259	1-162-306-11	CERAMIC	0.01uF	30%	16V
C260	1-162-306-11	CERAMIC	0.01uF	30%	16V
C261	1-162-306-11	CERAMIC	0.01uF	30%	16V
C262	1-124-463-00	ELECT	0.1uF	20%	50V
C263	1-162-306-11	CERAMIC	0.01uF	30%	16V
C264	1-162-306-11	CERAMIC	0.01uF	30%	16V
C265	1-162-294-31	CERAMIC	0.001uF	10%	50V
C266	1-162-306-11	CERAMIC	0.01uF	30%	16V
C271	1-162-306-11	CERAMIC	0.01uF	30%	16V
C272	1-162-306-11	CERAMIC	0.01uF	30%	16V
C273	1-162-306-11	CERAMIC	0.01uF	30%	16V
C274	1-162-306-11	CERAMIC	0.01uF	30%	16V
C275	1-124-918-11	ELECT	47uF	20%	63V
C276	1-162-306-11	CERAMIC	0.01uF	30%	16V
C277	1-162-306-11	CERAMIC	0.01uF	30%	16V
C278	1-124-557-11	ELECT	1000uF	20%	25V
C279	1-126-025-11	ELECT	330uF	20%	25V
C280	1-136-272-00	FILM	68PF	5%	630V
C281	1-102-518-11	CERAMIC	33PF	5%	50V
C282	1-162-306-11	CERAMIC	0.01uF	30%	16V
C283	1-110-335-11	MYLAR	100PF	5%	50V
C284	1-130-467-00	MYLAR	470PF	5%	50V
C285	1-110-340-11	MYLAR	270PF	5%	50V
C286	1-110-335-11	MYLAR	100PF	5%	50V
C287	1-124-122-11	ELECT	100uF	20%	50V
C288	1-110-340-11	MYLAR	270PF	5%	50V
C289	1-126-025-11	ELECT	330uF	20%	25V
C290	1-126-025-11	ELECT	330uF	20%	25V
C301	1-136-161-00	FILM	0.047uF	5%	50V

Ref. No.	Part No.	Description			Remark
C302	1-126-772-11	ELECT	0.47uF	20%	50V
C303	1-124-791-11	ELECT	1.0uF	20%	100V
C304	1-124-791-11	ELECT	1.0uF	20%	100V
C305	1-124-791-11	ELECT	1.0uF	20%	100V
C306	1-136-153-00	FILM	0.01uF	5%	50V
C307	1-126-772-11	ELECT	0.47uF	20%	50V
C308	1-136-153-00	FILM	0.01uF	5%	50V
C309	1-136-153-00	FILM	0.01uF	5%	50V
C310	1-124-252-00	ELECT	0.33uF	20%	50V
C311	1-124-463-00	ELECT	0.1uF	20%	50V
C312	1-126-772-11	ELECT	0.47uF	20%	50V
C313	1-137-273-11	FILM	750PF	5%	100V
C314	1-137-273-11	FILM	750PF	5%	100V
C315	1-102-953-00	CERAMIC	18PF	5%	50V
C316	1-102-953-00	CERAMIC	18PF	5%	50V
C317	1-124-122-11	ELECT	100uF	20%	50V
C318	1-124-713-11	ELECT	470uF	20%	35V
C319	1-124-791-11	ELECT	1.0uF	20%	100V
C351	1-130-475-00	MYLAR	0.0022uF	5%	50V
C352	1-126-059-11	ELECT	10uF	20%	50V
C353	1-126-059-11	ELECT	10uF	20%	50V
C354	1-110-335-11	MYLAR	100PF	5%	50V
C355	1-126-059-11	ELECT	10uF	20%	50V
C356	1-130-471-00	MYLAR	0.001uF	5%	50V
C361	1-130-475-00	MYLAR	0.0022uF	5%	50V
C362	1-126-059-11	ELECT	10uF	20%	50V
C363	1-126-059-11	ELECT	10uF	20%	50V
C364	1-110-335-11	MYLAR	100PF	5%	50V
C365	1-126-059-11	ELECT	10uF	20%	50V
C366	1-130-471-00	MYLAR	0.001uF	5%	50V
C371	1-126-025-11	ELECT	330uF	20%	25V
C372	1-136-167-00	FILM	0.15uF	5%	50V
C401	1-162-211-31	CERAMIC	33PF	5%	50V
C402	1-162-306-11	CERAMIC	0.01uF	30%	16V
C403	1-162-306-11	CERAMIC	0.01uF	30%	16V
C404	1-102-973-00	CERAMIC	100PF	5%	50V
C405	1-162-306-11	CERAMIC	0.01uF	30%	16V
C406	1-126-059-11	ELECT	10uF	20%	50V
C407	1-102-947-00	CERAMIC	10PF	5%	50V
C408	1-136-161-00	FILM	0.047uF	5%	50V
C409	1-162-306-11	CERAMIC	0.01uF	30%	16V
C410	1-162-306-11	CERAMIC	0.01uF	30%	16V
C411	1-162-306-11	CERAMIC	0.01uF	30%	16V
C412	1-162-306-11	CERAMIC	0.01uF	30%	16V
C413	1-162-306-11	CERAMIC	0.01uF	30%	16V
C414	1-124-918-11	ELECT	47uF	20%	63V
C415	1-162-306-11	CERAMIC	0.01uF	30%	16V
C416	1-162-306-11	CERAMIC	0.01uF	30%	16V
C417	1-162-306-11	CERAMIC	0.01uF	30%	16V
C418	1-162-294-31	CERAMIC	0.001uF	10%	50V

TUNER

Ref. No.	Part No.	Description				Remark
C419	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C420	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C421	1-124-122-11	ELECT	100uF	20%	50V	
C422	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C423	1-124-927-11	ELECT	4.7uF	20%	100V	
C424	1-126-111-11	ELECT	3.3uF	20%	50V	
C425	1-124-791-11	ELECT	1.0uF	20%	100V	
C426	1-124-791-11	ELECT	1.0uF	20%	100V	
C427	1-130-471-00	MYLAR	0.001uF	5%	50V	
C428	1-162-211-31	CERAMIC	33PF	5%	50V	
C429	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C801	1-124-925-11	ELECT	2.2uF	20%	100V	
C802	1-162-288-31	CERAMIC	330PF	10%	50V	
C803	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C804	1-162-292-31	CERAMIC	680PF	10%	50V	
C805	1-124-918-11	ELECT	47uF	20%	63V	
C806	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C807	1-101-880-00	CERAMIC	47PF	5%	50V	
C808	1-102-527-11	CERAMIC	82PF	5%	50V	
C911	1-130-789-00	FILM	1uF	5%	100V	
C912	1-101-004-00	CERAMIC	0.01uF		50V	
C913	1-101-004-00	CERAMIC	0.01uF		50V	
C914	1-101-004-00	CERAMIC	0.01uF		50V	
C915	1-101-004-00	CERAMIC	0.01uF		50V	
C916	1-125-714-11	ELECT	2200uF	20%	63V	
C917	1-124-122-11	ELECT	100uF	20%	50V	
C918	1-126-170-11	ELECT	1000uF	20%	50V	
C951	1-101-004-00	CERAMIC	0.01uF		50V	
C952	1-101-004-00	CERAMIC	0.01uF		50V	
C953	1-101-004-00	CERAMIC	0.01uF		50V	
C954	1-101-004-00	CERAMIC	0.01uF		50V	
C955	1-126-105-11	ELECT	1000uF	20%	35V	
C956	1-124-918-11	ELECT	47uF	20%	63V	
C957	1-124-122-11	ELECT	100uF	20%	50V	
C981	1-101-004-00	CERAMIC	0.01uF		50V	
C982	1-124-920-11	ELECT	330uF	20%	63V	
C983	1-124-918-11	ELECT	47uF	20%	63V	
C984	1-124-918-11	ELECT	47uF	20%	63V	
		< FILTER >				
CF201	1-567-389-11	FILTER, CERAMIC				
CF202	1-567-389-11	FILTER, CERAMIC				
CF203	1-567-389-11	FILTER, CERAMIC				
CF231	1-579-554-31	FILTER, CERAMIC				
CF301	1-567-250-11	OSCILLATOR, CERAMIC				
CF401	1-527-826-00	FILTER, CERAMIC				
CF402	1-527-981-00	FILTER, CERAMIC				
		< CONNECTOR >				
CN701	1-766-282-11	PIN, CONNECTOR (PC BOARD) 9P				
CN702	1-766-282-11	PIN, CONNECTOR (PC BOARD) 9P				
* CN904	1-560-062-00	PIN, CONNECTOR 4P				
* CN905	1-560-061-00	PIN, CONNECTOR 3P				
CNJ371	1-568-250-21	JACK, PIN 2P (LINE OUT)				
		< TRIMMER >				
CT271	1-141-232-00	CAP, TRIMMER				
		< DIODE >				
D201	8-719-815-85	DIODE	1S1585			
D202	8-719-815-85	DIODE	1S1585			
D203	8-719-815-85	DIODE	1S1585			
D221	8-719-815-85	DIODE	1S1585			
D261	8-719-815-85	DIODE	1S1585			
D271	8-719-815-85	DIODE	1S1585			
D272	8-719-815-85	DIODE	1S1585			
D273	8-719-815-85	DIODE	1S1585			
D274	8-719-815-85	DIODE	1S1585			
D275	8-719-110-13	DIODE	RD9.1ESB2			
D276	8-719-921-44	DIODE	MTZJ-5.1C			
D277	8-719-053-48	DIODE	SVC324-AC2			
D301	8-719-815-85	DIODE	1S1585			
D302	8-719-815-85	DIODE	1S1585			
D303	8-719-815-85	DIODE	1S1585			
D304	8-719-815-85	DIODE	1S1585			
D401	8-719-815-85	DIODE	1S1585			
D402	8-719-815-85	DIODE	1S1585			
D403	8-719-815-85	DIODE	1S1585			
D911	8-719-970-02	DIODE	1SR139-400			
D912	8-719-970-02	DIODE	1SR139-400			
D913	8-719-970-02	DIODE	1SR139-400			
D914	8-719-970-02	DIODE	1SR139-400			
D915	8-719-109-89	DIODE	RD5.6ESB2			
D951	8-719-970-02	DIODE	1SR139-400			
D952	8-719-970-02	DIODE	1SR139-400			
D953	8-719-970-02	DIODE	1SR139-400			
D954	8-719-970-02	DIODE	1SR139-400			
D981	8-719-970-02	DIODE	1SR139-400			
D982	8-719-982-27	DIODE	MTZJ-33C			
D983	8-719-110-06	DIODE	RD8.2ESB1			
		< GROUND PLATE >				
* EB001	3-346-266-21	PLATE, GROUND				
* EB002	4-870-539-00	PLATE, GROUND				
		< FRONT END >				
FE101	1-693-289-11	FRONT END (ANTENNA)				
FE401	1-233-312-11	ENCAPSULATED COMPONENT				

Ref.No.	Part No.	Description		Remark
		< IC >		
IC221	8-759-812-35	IC	LA1235	
IC251	8-759-812-35	IC	LA1235	
IC271	8-759-273-02	IC	TA7302P	
IC272	8-759-602-01	IC	M5220P	
IC301	8-759-802-57	IC	CXA1064S	
IC351	8-759-602-01	IC	M5220P	
IC401	8-759-812-45	IC	LA1245	
IC801	8-759-169-99	IC	SAA6579	
IC951	8-759-820-09	IC	LA5667	
		< IFT >		
IFT251	1-404-669-11	COIL, DISCRIMINATOR		
IFT271	1-404-668-11	COIL, FM DET (1)		
IFT272	1-411-276-11	COIL (PLL)		
IFT401	1-404-326-00	TRANSFORMER, IF		
		< COIL >		
L201	1-410-521-11	INDUCTOR	100uH	
L202	1-410-521-11	INDUCTOR	100uH	
L203	1-410-521-11	INDUCTOR	100uH	
L231	1-410-521-11	INDUCTOR	100uH	
L271	1-410-335-11	INDUCTOR	150uH	
L301	1-409-413-11	COIL (TUNING)		
L351	1-410-509-11	INDUCTOR	10uH	
L361	1-410-509-11	INDUCTOR	10uH	
L401	1-410-521-11	INDUCTOR	100uH	
L402	1-414-142-11	INDUCTOR	1uH	
		< FILTER >		
LPF271	1-235-892-11	FILTER, LOW PASS		
LPF371	1-236-560-11	ENCAPSULATED COMPONENT (LPF)		
		< TRANSISTOR >		
Q101	8-729-030-03	TRANSISTOR	DTC144ESA	
Q102	8-729-119-76	TRANSISTOR	2SA1175-HFE	
Q103	8-729-119-78	TRANSISTOR	2SC403SP-51	
Q201	8-729-231-20	TRANSISTOR	2SK161-YGR	
Q202	8-729-230-99	TRANSISTOR	2SC2669-OY	
Q203	8-729-230-99	TRANSISTOR	2SC2669-OY	
Q204	8-729-230-99	TRANSISTOR	2SC2669-OY	
Q205	8-729-230-99	TRANSISTOR	2SC2669-OY	
Q206	8-729-230-99	TRANSISTOR	2SC2669-OY	
Q207	8-729-030-03	TRANSISTOR	DTC144ESA	
Q208	8-729-029-69	TRANSISTOR	DTC114TSA	
Q231	8-729-030-07	TRANSISTOR	DTC144TSA	
Q232	8-729-230-99	TRANSISTOR	2SC2669-OY	
Q233	8-729-230-99	TRANSISTOR	2SC2669-OY	
Q234	8-729-030-07	TRANSISTOR	DTC144TSA	
Q235	8-729-030-07	TRANSISTOR	DTC144TSA	
Q236	8-729-119-78	TRANSISTOR	2SC403SP-51	
Q237	8-729-119-78	TRANSISTOR	2SC403SP-51	
Q251	8-729-230-99	TRANSISTOR	2SC2669-OY	
Q271	8-729-031-73	TRANSISTOR	2SK937Y4Y5-A	
Q272	8-729-224-61	TRANSISTOR	2SK246-Y	
Q301	8-729-224-61	TRANSISTOR	2SK246-Y	
Q302	8-729-224-61	TRANSISTOR	2SK246-Y	
Q303	8-729-224-61	TRANSISTOR	2SK246-Y	
Q304	8-729-224-61	TRANSISTOR	2SK246-Y	
Q306	8-729-030-07	TRANSISTOR	DTC144TSA	
Q351	8-729-922-37	TRANSISTOR	2SD2144S	
Q361	8-729-922-37	TRANSISTOR	2SD2144S	
Q371	8-729-224-61	TRANSISTOR	2SK246-Y	
Q372	8-729-224-61	TRANSISTOR	2SK246-Y	
Q373	8-729-030-03	TRANSISTOR	DTC144ESA	
Q401	8-729-231-20	TRANSISTOR	2SK161-YGR	
Q402	8-729-922-37	TRANSISTOR	2SD2144S	
Q403	8-729-922-37	TRANSISTOR	2SD2144S	
Q404	8-729-922-37	TRANSISTOR	2SD2144S	
Q405	8-729-230-99	TRANSISTOR	2SC2669-OY	
Q406	8-729-030-03	TRANSISTOR	DTC144ESA	
Q911	8-729-224-61	TRANSISTOR	2SK246-Y	
Q912	8-729-281-53	TRANSISTOR	2SC1815-GR	
Q913	8-729-127-53	TRANSISTOR	2SC2275-P	
Q914	8-729-281-53	TRANSISTOR	2SC1815-GR	
Q951	8-729-029-57	TRANSISTOR	DTA144ESA	
Q981	8-729-140-97	TRANSISTOR	2SB734-34	
		< RESISTOR >		
⚠R101	1-249-417-11	CARBON	1K 5% 1/4W F	
⚠R102	1-249-405-11	CARBON	100 5% 1/4W F	
⚠R103	1-249-405-11	CARBON	100 5% 1/4W F	
R104	1-259-452-11	CARBON	10K 5% 1/6W	
R105	1-259-468-11	CARBON	47K 5% 1/6W	
R106	1-259-460-11	CARBON	22K 5% 1/6W	
R107	1-259-440-11	CARBON	3.3K 5% 1/6W	
R108	1-259-476-11	CARBON	100K 5% 1/6W	
R201	1-259-416-11	CARBON	330 5% 1/6W	
R202	1-259-416-11	CARBON	330 5% 1/6W	
R203	1-259-416-11	CARBON	330 5% 1/6W	
R204	1-259-456-11	CARBON	15K 5% 1/6W	
R205	1-259-420-11	CARBON	470 5% 1/6W	
R206	1-259-420-11	CARBON	470 5% 1/6W	
R207	1-259-416-11	CARBON	330 5% 1/6W	
R208	1-259-460-11	CARBON	22K 5% 1/6W	
R209	1-259-416-11	CARBON	330 5% 1/6W	
R210	1-259-456-11	CARBON	15K 5% 1/6W	
R211	1-259-416-11	CARBON	330 5% 1/6W	
R212	1-259-460-11	CARBON	22K 5% 1/6W	
R213	1-259-420-11	CARBON	470 5% 1/6W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

TUNER

Ref. No.	Part No.	Description				Remark
R214	1-259-476-11	CARBON	100K	5%	1/6W	
R215	1-259-428-11	CARBON	1K	5%	1/6W	
R216	1-259-460-11	CARBON	22K	5%	1/6W	
R217	1-259-452-11	CARBON	10K	5%	1/6W	
⚠R218	1-249-393-11	CARBON	10	5%	1/4W	F
R221	1-259-416-11	CARBON	330	5%	1/6W	
R222	1-259-480-11	CARBON	150K	5%	1/6W	
⚠R223	1-249-405-11	CARBON	100	5%	1/4W	F
R231	1-259-416-11	CARBON	330	5%	1/6W	
R232	1-259-456-11	CARBON	15K	5%	1/6W	
R233	1-259-416-11	CARBON	330	5%	1/6W	
R234	1-259-460-11	CARBON	22K	5%	1/6W	
R236	1-259-452-11	CARBON	10K	5%	1/6W	
R237	1-259-452-11	CARBON	10K	5%	1/6W	
R238	1-259-428-11	CARBON	1K	5%	1/6W	
R239	1-259-456-11	CARBON	15K	5%	1/6W	
R240	1-259-428-11	CARBON	1K	5%	1/6W	
R251	1-259-416-11	CARBON	330	5%	1/6W	
R252	1-259-468-11	CARBON	47K	5%	1/6W	
R253	1-259-472-11	CARBON	68K	5%	1/6W	
R254	1-259-456-11	CARBON	15K	5%	1/6W	
R255	1-259-444-11	CARBON	4.7K	5%	1/6W	
⚠R256	1-249-405-11	CARBON	100	5%	1/4W	F
R257	1-259-472-11	CARBON	68K	5%	1/6W	
R258	1-259-468-11	CARBON	47K	5%	1/6W	
R259	1-259-476-11	CARBON	100K	5%	1/6W	
R260	1-259-428-11	CARBON	1K	5%	1/6W	
R261	1-259-476-11	CARBON	100K	5%	1/6W	
R262	1-259-480-11	CARBON	150K	5%	1/6W	
R263	1-259-428-11	CARBON	1K	5%	1/6W	
R264	1-259-428-11	CARBON	1K	5%	1/6W	
R265	1-259-428-11	CARBON	1K	5%	1/6W	
⚠R266	1-249-393-11	CARBON	10	5%	1/4W	F
R271	1-259-436-11	CARBON	2.2K	5%	1/6W	
R272	1-259-416-11	CARBON	330	5%	1/6W	
R273	1-259-428-11	CARBON	1K	5%	1/6W	
⚠R274	1-249-393-11	CARBON	10	5%	1/4W	F
R275	1-259-428-11	CARBON	1K	5%	1/6W	
R276	1-259-428-11	CARBON	1K	5%	1/6W	
R277	1-259-428-11	CARBON	1K	5%	1/6W	
R278	1-259-428-11	CARBON	1K	5%	1/6W	
R279	1-259-428-11	CARBON	1K	5%	1/6W	
⚠R280	1-249-405-11	CARBON	100	5%	1/4W	F
R281	1-259-476-11	CARBON	100K	5%	1/6W	
R282	1-259-412-11	CARBON	220	5%	1/6W	
R283	1-259-414-11	CARBON	270	5%	1/6W	
R284	1-259-462-11	CARBON	27K	5%	1/6W	
R285	1-259-452-11	CARBON	10K	5%	1/6W	
R286	1-259-500-11	CARBON	1M	5%	1/6W	
R287	1-259-446-11	CARBON	5.6K	5%	1/6W	

Ref. No.	Part No.	Description				Remark
R288	1-259-458-11	CARBON	18K	5%	1/6W	
R289	1-259-460-11	CARBON	22K	5%	1/6W	
R290	1-259-440-11	CARBON	3.3K	5%	1/6W	
R291	1-259-438-11	CARBON	2.7K	5%	1/6W	
R292	1-259-420-11	CARBON	470	5%	1/6W	
⚠R293	1-249-405-11	CARBON	100	5%	1/4W	F
R301	1-259-440-11	CARBON	3.3K	5%	1/6W	
R302	1-259-456-11	CARBON	15K	5%	1/6W	
R303	1-259-448-11	CARBON	6.8K	5%	1/6W	
R304	1-259-450-11	CARBON	8.2K	5%	1/6W	
R305	1-259-476-11	CARBON	100K	5%	1/6W	
R306	1-259-476-11	CARBON	100K	5%	1/6W	
R307	1-259-484-11	CARBON	220K	5%	1/6W	
R308	1-259-484-11	CARBON	220K	5%	1/6W	
R309	1-259-500-11	CARBON	1M	5%	1/6W	
R310	1-259-500-11	CARBON	1M	5%	1/6W	
R311	1-259-500-11	CARBON	1M	5%	1/6W	
R312	1-259-500-11	CARBON	1M	5%	1/6W	
⚠R313	1-249-393-11	CARBON	10	5%	1/4W	F
R315	1-259-483-11	CARBON	200K	5%	1/6W	
R316	1-259-483-11	CARBON	200K	5%	1/6W	
R351	1-259-392-11	CARBON	33	5%	1/6W	
R352	1-259-448-11	CARBON	6.8K	5%	1/6W	
R353	1-259-448-11	CARBON	6.8K	5%	1/6W	
R354	1-259-444-11	CARBON	4.7K	5%	1/6W	
R355	1-259-420-11	CARBON	470	5%	1/6W	
R356	1-259-468-11	CARBON	47K	5%	1/6W	
R361	1-259-392-11	CARBON	33	5%	1/6W	
R362	1-259-448-11	CARBON	6.8K	5%	1/6W	
R363	1-259-448-11	CARBON	6.8K	5%	1/6W	
R364	1-259-444-11	CARBON	4.7K	5%	1/6W	
R365	1-259-420-11	CARBON	470	5%	1/6W	
R366	1-259-468-11	CARBON	47K	5%	1/6W	
⚠R371	1-249-401-11	CARBON	47	5%	1/4W	F
R372	1-259-500-11	CARBON	1M	5%	1/6W	
R373	1-259-500-11	CARBON	1M	5%	1/6W	
R374	1-259-452-11	CARBON	10K	5%	1/6W	
R375	1-259-428-11	CARBON	1K	5%	1/6W	
R376	1-259-428-11	CARBON	1K	5%	1/6W	
R377	1-259-468-11	CARBON	47K	5%	1/6W	
R401	1-259-436-11	CARBON	2.2K	5%	1/6W	
R402	1-259-434-11	CARBON	1.8K	5%	1/6W	
R403	1-259-436-11	CARBON	2.2K	5%	1/6W	
R404	1-259-430-11	CARBON	1.2K	5%	1/6W	
R405	1-259-430-11	CARBON	1.2K	5%	1/6W	
R406	1-259-476-11	CARBON	100K	5%	1/6W	
R407	1-259-428-11	CARBON	1K	5%	1/6W	
R408	1-259-436-11	CARBON	2.2K	5%	1/6W	
R409	1-259-438-11	CARBON	2.7K	5%	1/6W	
R410	1-259-420-11	CARBON	470	5%	1/6W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
R411	1-259-480-11	CARBON	150K	5%	1/6W	
R412	1-259-476-11	CARBON	100K	5%	1/6W	
R413	1-259-438-11	CARBON	2.7K	5%	1/6W	
R414	1-259-428-11	CARBON	1K	5%	1/6W	
R415	1-259-428-11	CARBON	1K	5%	1/6W	
R416	1-259-404-11	CARBON	100	5%	1/6W	
R417	1-259-404-11	CARBON	100	5%	1/6W	
R418	1-259-452-11	CARBON	10K	5%	1/6W	
R419	1-259-452-11	CARBON	10K	5%	1/6W	
R420	1-259-454-11	CARBON	12K	5%	1/6W	
R421	1-259-448-11	CARBON	6.8K	5%	1/6W	
⚠R422	1-249-407-11	CARBON	150	5%	1/4W	F
R423	1-259-452-11	CARBON	10K	5%	1/6W	
⚠R424	1-249-409-11	CARBON	220	5%	1/4W	F
⚠R425	1-249-393-11	CARBON	10	5%	1/4W	F
⚠R801	1-249-401-11	CARBON	47	5%	1/4W	F
R802	1-259-436-11	CARBON	2.2K	5%	1/6W	
⚠R911	1-249-397-11	CARBON	22	5%	1/4W	F
R912	1-259-412-11	CARBON	220	5%	1/6W	
R913	1-259-452-11	CARBON	10K	5%	1/6W	
R914	1-259-448-11	CARBON	6.8K	5%	1/6W	
R951	1-259-468-11	CARBON	47K	5%	1/6W	
⚠R981	1-249-409-11	CARBON	220	5%	1/4W	F
R982	1-259-444-11	CARBON	4.7K	5%	1/6W	
R983	1-259-468-11	CARBON	47K	5%	1/6W	
R984	1-259-476-11	CARBON	100K	5%	1/6W	
R985	1-259-468-11	CARBON	47K	5%	1/6W	
		< VARIABLE RESISTOR >				
RV221	1-237-460-11	RES, ADJ, CARBON 20K				
RV231	1-237-458-21	RES, ADJ, CARBON 5K				
RV232	1-237-455-11	RES, ADJ, CARBON 500				
RV251	1-237-459-11	RES, ADJ, CARBON 10K				
RV301	1-237-461-11	RES, ADJ, CARBON 50K				
RV302	1-237-464-11	RES, ADJ, CARBON 500K				
RV303	1-237-464-11	RES, ADJ, CARBON 500K				
RV304	1-237-464-11	RES, ADJ, CARBON 500K				
RV305	1-237-464-11	RES, ADJ, CARBON 500K				
RV401	1-237-459-11	RES, ADJ, CARBON 10K				
		< THERMISTOR >				
TH271	1-807-972-11	THERMISTOR				
		< TERMINAL >				
TM401	1-537-897-11	TERMINAL BOARD, PUSH(ANTENNA) 2P				
		< TEST PIN >				
* TP201	1-565-513-11	PIN, CONNECTOR 2P				
* TP271	1-565-513-11	PIN, CONNECTOR 2P				

Ref. No.	Part No.	Description	Remark
		< VIBRATOR >	
X801	1-579-900-21	VIBRATOR, CRYSTAL (4.332MHz)	
		**********	
		MISCELLANEOUS	
		**********	
⚠24	1-575-651-21	CORD, POWER	
FL701	1-517-427-11	INDICATOR TUBE, FLUORESCENT	
⚠PT901	1-450-409-21	TRANSFORMER, POWER	
RV701	1-467-927-11	ENCODER, ROTARY (TUNING/SELECT)	
S726	1-762-199-11	SWITCH, ROTARY (PROGRAM)	
		**********	
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-501-594-11	ANTENNA (FM)	
	1-501-761-41	ANTENNA, LOOP	
	1-590-925-31	CORD, CONNECTION (AUDIO 100cm)	
	3-798-043-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (AEP)	
	3-798-043-31	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN) (AEP)	
	3-798-043-61	MANUAL, INSTRUCTION (GERMAN) (G)	
*	4-974-634-01	INDIVIDUAL CARTON	
*	4-974-636-01	CUSHION	
		**********	
		HARDWARE LIST	
		**********	
#1	7-682-548-09	SCREW (3X8)	
#2	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-959-846-31

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

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